May 1987
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Commodore MAGAZINE



What Next for Commodore?

Exclusive Interview: CEO Tom Rattigan

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- Fully automatic upper and lower case type conversion†
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- Word Count feature for essays and assignments†
- Enhanced split memory mail merge option

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In additon to the new features above . . .

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- Able to print mathematical formulae as well as results of calculations†
- Global formatting option
- Enhanced row/column insert delete†
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- Increased file compatability with other spreadsheets†
- Number of rows increased from 99 to 250†

Pocket Filer 2 Database
In addition to the new features above . . .

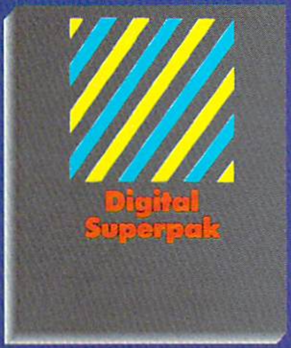
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- Automatic entry of repetative data†

Serious Software That's Simple to Use

*Commodore's Microcomputers Magazine, independent reviewers, rated the original Pocket Writer 128/64 and Pocket Planner 128/64 software the "Annual Best of 1986" in the productivity category.

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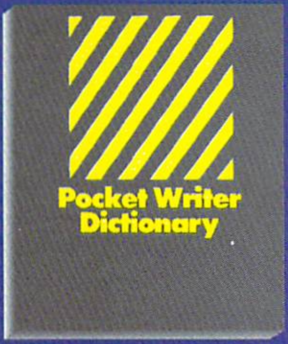
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Pocket Writer Dictionary



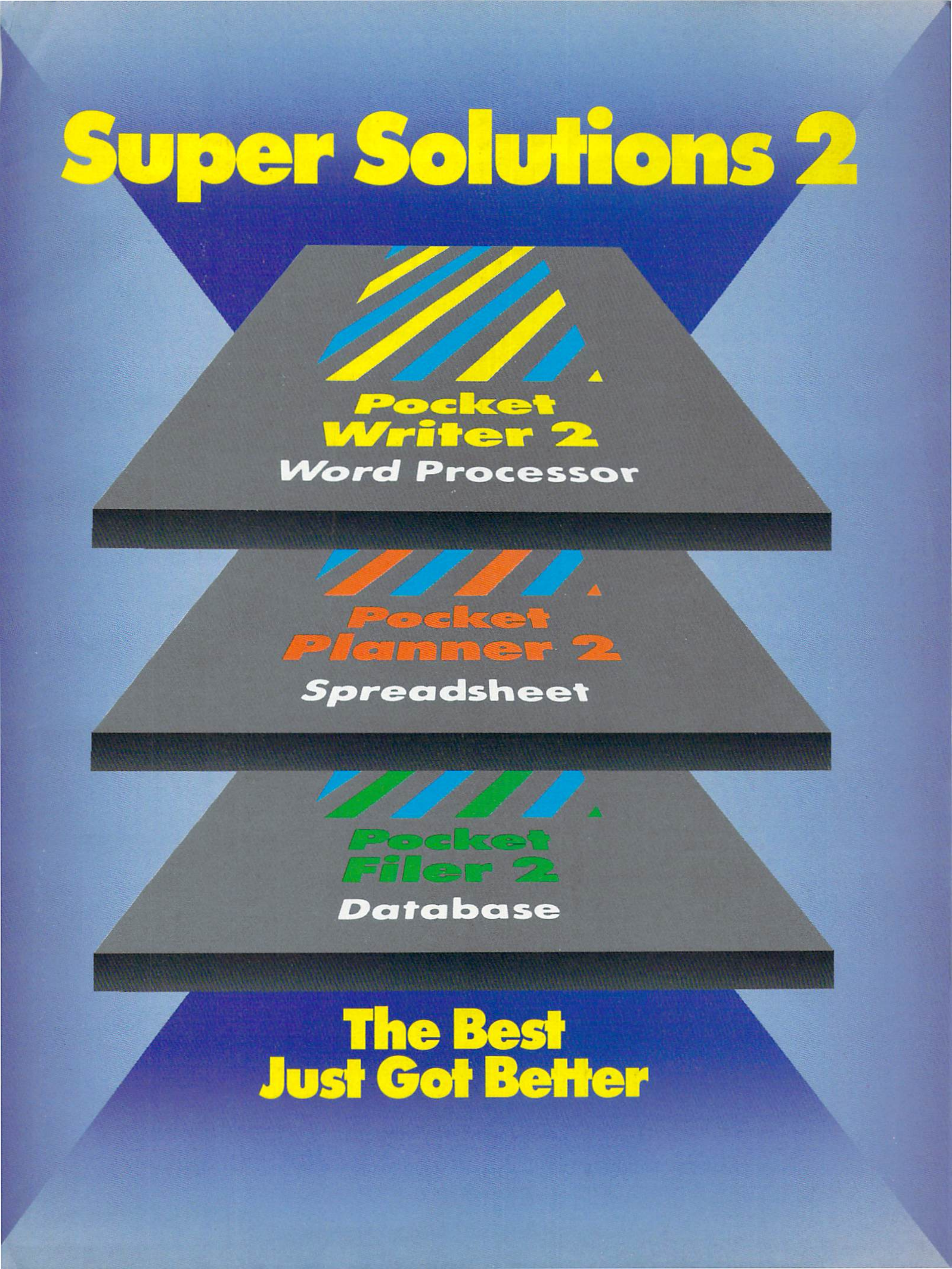
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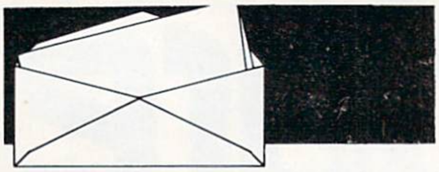
VOLUME 8, NUMBER 5 — MAY 1987

commodore MAGAZINE

DEPARTMENTS

FEATURES

LETTERS



World of Weirdware

To the Editor:

Recent letters inquiring about our *Family Roots* genealogy program for the Commodore 64 have caused some surprise and amusement here at Quinsept. However, we have tracked the source back to the article "The World of Weirdware" in your October/November, 1986, issue, and we thank you for referring your readers to us!

Although we hadn't recognized ourselves before as "weirdware" producers, perhaps we should have. Our customers use *Family Roots* for purposes we never dreamed of.

Family Roots is being used for recording bloodlines for breeding purposes. In Vermont, one customer uses it for horse and cow pedigrees. A Brazilian uses it to keep track of his race horses. We also have cat and dog pedigree users. One girl raising pedigree rabbits for her 4-H project uses *Family Roots* to produce pedigree certificates for her customers. Perhaps the most intriguing use is a university biologist's beetles ancestry research.

Pediatricians and doctors studying genetics use it. Several lawyers use it for estate cases. One funeral home director in a small town maintains a copy as a service to his customers since most of the town is related. Churches use the program to keep track of their membership.

Some weirdly wonderfully wildly enthusiastic customers have even translated the program into Dutch and Danish. They are marketing it overseas for us! *Family Roots* works on many different computers. About 1,000 of our 8,500+ customers use our Commodore 64 version.

Pat Vorenberg, Vice President
Quinsept, Inc.
Lexington, Massachusetts

Tips & Tricks

To the Editor:

In the Tips & Tricks column in the January, 1987, issue of *Commodore Magazine* under "Disk Buyer's Guide," Louis Sander made the following comment: "Commodore drives are made for double-density disks, so that's what you should buy."

This statement did not jive with my recollection of what I had read in the user's manual that came with my disk drive. So I did some checking in the Folklife Terminal Club's Commodore library and found the following.

From the user's manual for CBM Dual Floppys, 1980, pages 6-8 for the 2040, 3040, 4040, and 8050 drives: "MEDIA diskettes Standard mini 5¼, single-sided, single-density."

In the Commodore 1541 Disk Drive User's Guide, 1982, page 3: "MEDIA diskettes Standard mini 5¼, single-sided, single-density."

There was a slight difference in the Commodore Computer Disk System User Reference Guide, 1982, page 11: "Any soft-sector single-density or double-density certified disk will work well with Commodore units. However, for the 8050 and 8250 disk units, double-density disks are recommended."

For many years the members of our user group have used both single- and double-density disks with equal success. Why spend more for double when single will do?

Bill Schachter, Vice President
Folklife Terminal Club
Bronx, New York

Flight Simulator II

To the Editor:

Since I do not have a modem and I cannot get the word out to everyone, I hope by advising you and other magazines of the following information about *Flight Simulator II* for the Amiga, you can save some people some problems with the program.

When you start the program and pull down the NAV menu and go to POSITION SET to put in your coordinates for any of the Chicago area airfields, you will find that if you use the altitude settings that are given to you on the maps, you will promptly do a nose dive into the ground.

When I advised the SubLogic people about the problem, they called me back soon after and advised me to use zero (0) altitude instead of those indicated on the map. It worked, and for all your readers that are doing nose dives near Chicago, zero is the magic number.

Paul Messina
Holbrook, New York

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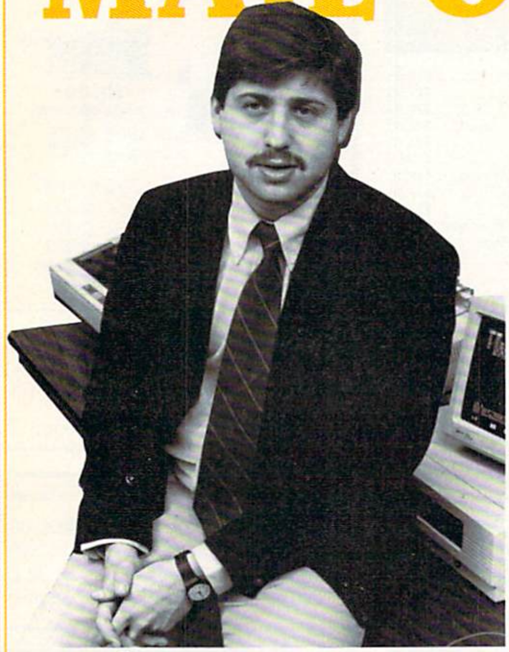
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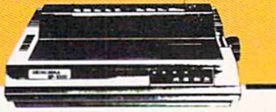
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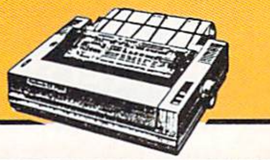
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DeluxePaint II

Electronic Arts has released **DeluxePaint II** for the Amiga. **DeluxePaint II** introduces over 50 new effects, including Perspective effects, Stenciling, Fixed Backgrounds, Gradient Fills and Pattern Fills.

Electronic Arts is offering an upgrade for owners of **DeluxePaint.** The company will send the **DeluxePaint II** disk to owners who send in the front cover of their **DeluxePaint** manual and $30 (plus $7 for shipping and handling).

For an additional $20, Electronic Arts will provide an un-copyprotected version of the program. Users who purchased the un-copyprotected version of the original **DeluxePaint** need only supply Electronic Arts with the disk and $30 to receive the un-copyprotected version of **DeluxePaint II.**

Details for ordering may be obtained by contacting Electronic Arts at 800-245-4525. (1820 Gateway Drive, San Mateo, CA 94404)

Football Simulator for the Amiga



Gridiron! from Bethesda Softworks takes advantage of the 68000's processing capabilities by combining realistic football strategy with fast, real-time action.

For one or two players, **Gridiron!** uses all but 10K of the Amiga's half-megabyte of RAM (512K required). You use the keyboard only to enter names of teams, playbooks and individual plays. All other interaction, including selecting options and players, is handled with the mouse.

Gridiron! comes with a standard playbook that contains 40 predesigned plays (20 offense, 20 defense). Plays may be taken right from the playbook or may be modified using **Gridiron!**'s Play Creation Utility, an electronic chalkboard that gives editing control over your team's strategy. Or you can modify existing plays from the playbook or make up you own plays from scratch.

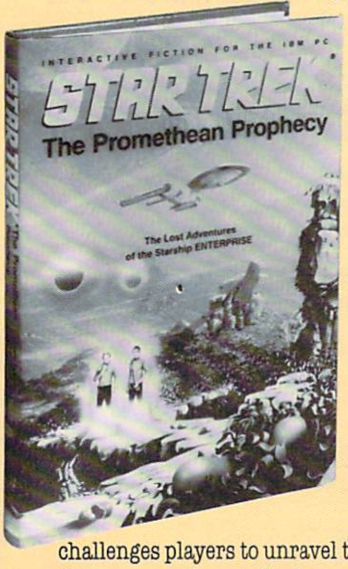
The program retails for $69.95 and is warranteed for a year. To order, contact Bethesda Softworks at 800-992-4009. (Bethesda Softworks, 9208 Burning Tree Road, Bethesda, MD 20817).

Street Sports

Epyx has released **Street Sports Basketball** for the Commodore 64, the first program in the Street Sports line that recreates those winner-take-all playground games.

In **Street Sports Basketball,** players pick their three- person team from ten individuals. Some are great shooters, some are strong rebounders—but the important thing to remember is that all of them have strong and weak points. And then there's four neighborhood scenes to choose from- -alleys, parking lots—and naturally, these courts have their fair share of obstacles like curbs, oil slicks and fences.

Retail price was not available for publication. (Epyx, 600 Galveston Drive, Redwood City, CA 94063)



Star Trek: The Promethean Prophecy

Simon & Shuster has released its second Star Trek fantasy: **Star Trek: The Promethean Prophecy.** Spawned by the success of **Star Trek: The Kobayashi Alternative,** the new text game challenges players to unravel the mystery of a complex culture and discover an adequate food source before the Enterprise crew starves.

In **Star Trek: The Promethean Prophecy,** you are projected into the midst of a fictional world. You are Captain Kirk and while exploring an unmapped sector of space near the border of the Great Transtellar Rift, the Enterprise comes under sudden attack. As a result, your entire stock of raw protein substance (the base material of synthesized foods) is contaminated. To replenish the Enterprise's food supply, you must beam down to the surface of Prometheus Four, the only class M (oxygen-nitrogen atmosphere) planet within range, on an exploratory mission.

On the planet, you discover a fascinating population full of mysteries and secrets. To win the game, you must solve a series of puzzles. The solutions will unearth the planet's secret prophecy and save the Enterprise crew from starvation.

Under exclusive license from Paramount Pictures, the creators of Star Trek, **Star Trek: The Promethean Prophecy** retails for $32.95 from Simon & Schuster, Gulf & Western Building, One Gulf & Western Plaza, New York, NY 10023.

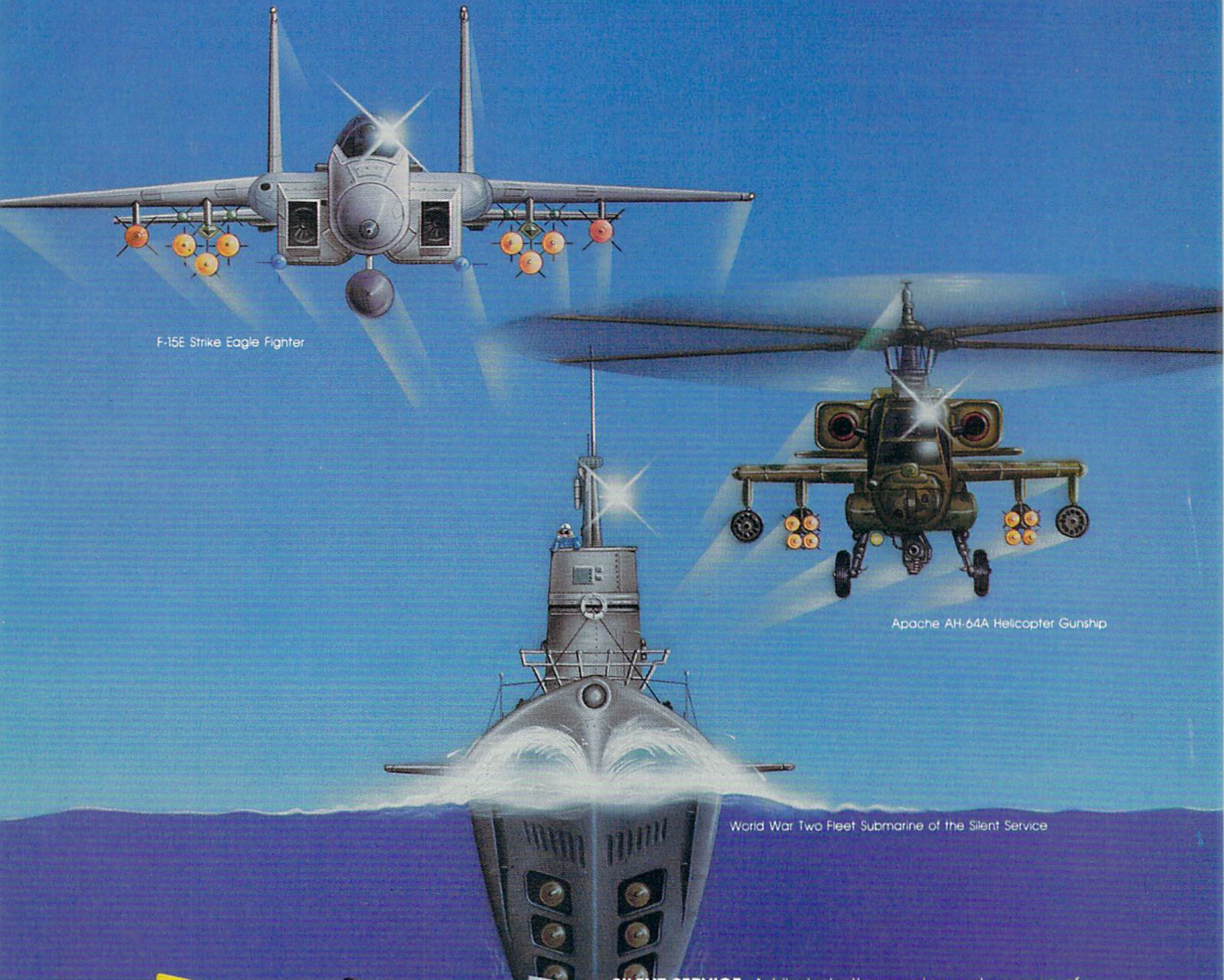
Telecommunications Software

Abacus Software has released **SpeedTerm,** a command-driven telecommunications program that supports most low-cost modems. In addition to the standard options found in most telecommunications software, **SpeedTerm** performs VT52 terminal emulation, supports both Xmodem and Punter file transfer protocols, provides a large capture buffer, and permits user-defined function keys. **SpeedTerm** understands more than 30 commands.

SpeedTerm has versions for both the Commodore 64 and the

Continued on pg. 10

Face to Face with Excitement!



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World War Two Fleet Submarine of the Silent Service



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F-15 Strike Eagle available for Commodore 64/128, Apple IIc/e/+(64k), Atari XL/XE/520ST, IBM PC/PCjr and compatibles, and Tandy 1000 Series. Gunship available for Commodore 64/128, Apple IIc/e/+(64k), IBM PC/PCjr and compatibles, and Tandy 1000 Series; coming soon for Atari XL/XE/520ST and Amiga. Silent Service available for Commodore 64/128, Amiga, Apple IIc/e/+(64k) and IIgs, Atari XL/XE/520ST, IBM PC/PCjr and compatibles, and Tandy 1000 Series. All products have suggested retail prices of either $34.95 or $39.95.

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Continued from pg. 8

128, and a 70-page manual that includes a tutorial. The suggested retail price is $39.95. (Abacus Software, P.O. Box 7211, Grand Rapids, MI 49510)

Amiga Tips & Tricks

Abacus Software has released its second Amiga book, **Amiga Tricks & Tips.** In addition to showing how to display 64 colors on the screen simultaneously, access libraries from BASIC and create your own character sets, there are dozens of tips for using AmigaDOS, graphics, programming aids and the mouse. Suggested retail price is $19.95. (Abacus Software, P.O. Box 7211, Grand Rapids, MI 49510)

Additional Leader Board Golf Courses

Access Software has released two additional golf courses, Augusta and Pinehurst, for use with **Leader Board,** the company's golf simulation for the Commodore 64. Each hole includes the distance, traps, water hazards and rough of the actual courses. Also included are features like computerized scoring, a handicap system, and the choice of club, power and other variables.

Famous Courses of the World uses a joystick for game play and carries a suggested retail price of $19.95. (Access Software, 2561 South 1560 West, Woods Cross, UT 84087)

Bible Scripture Game

Scriptural Software Unlimited has released **Bible Bytes,** a Bible program for the Commodore 64 with both New Testament and Psalms and Proverbs versions. Suitable for individuals or Christian education, **Bible Bytes** presents scriptures in three formats: Word Blanks, Word Scramble and Word Pop. It provides a 50-verse range of preprogrammed scriptures for study and memorization; offers an advanced option mode which allows for insertion and deletion of any 50 additional verses at one time; contains an optional timer mode for team competition; and utilizes the New International Version of the Bible for ease of comprehension.

The scripture memory game sells for $29.95 and is available directly from Scriptural Software Unlimited, 2613 Via Vera, Carlsbad, CA 92008, 619-434-2121.

Yacht Racing Simulation

Electronic Arts has released **The Official America's Cup Sailing Simulation** for the Commodore 64. This one- or two-player game puts you on the actual Perth course, where you use a joystick to select, raise and lower sails, navigate the ship, and overlook the entire course as viewed by the helmsman.

The action begins as you take the helm of a 12-meter yacht. You complete an eight-leg race across a triangular course which covers over 24.1 nautical miles. It includes most of the elements of yacht racing: the sound of the wind, a complete instrument panel, calm seas and choppy whitecaps. Depending on the weather, sails must be hoisted and lowered. Skippers have a choice of three genoas and three spinnaker sails with a range of six headsails.

Three levels of play, including Amateur, Club Race and America's Cup Challenger, test your skills. A Command Summary card provides specific computer commands, a course map and information about the race for reference. The Indicator Panel gives updated information about the weather, the position and direction of the yacht, and the progress of the race. The panel also keeps you on course, enabling you to sail through fog and other inclement weather conditions.

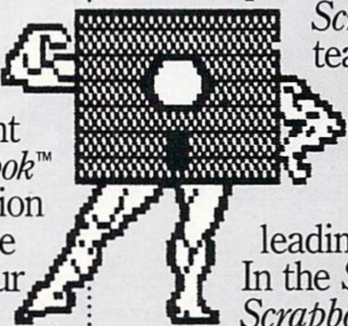
The Official America's Cup Sailing Simulation includes a manual with descriptions of over 70 nautical terms, a basic sailing guide for landlubbers, and a historical account of the race's origin from 1851 up to America's loss of the cup to Australia in 1983. It also provides information on the 1987 race—details about all the challengers including the name of each yacht, its country of origin, and club or syndicate.

The program retails for $24.95. (Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404)



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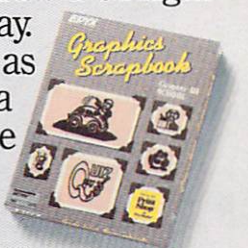


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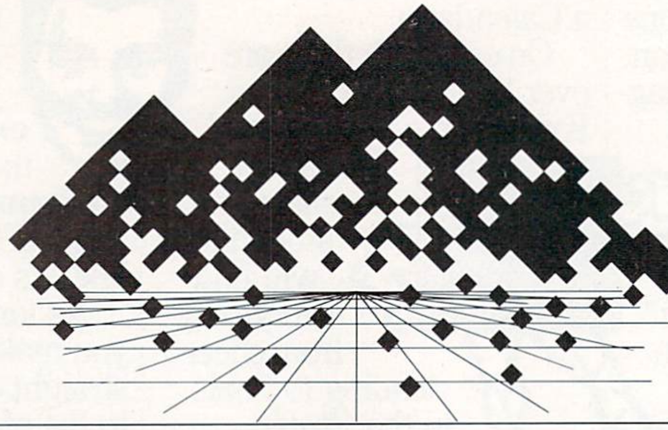
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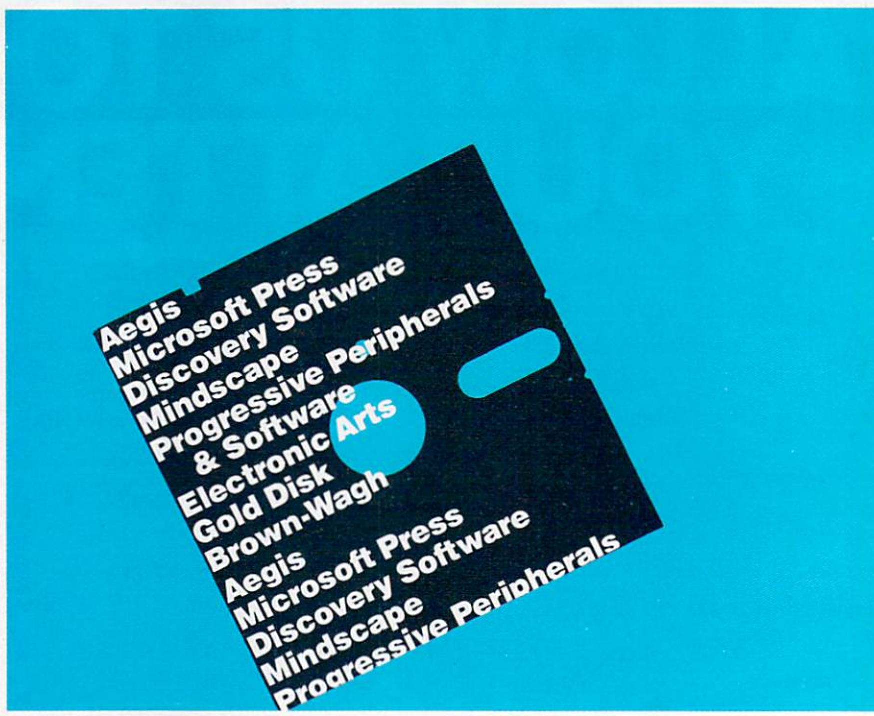




BY MATTHEW LEEDS

From Computer Scrabble to World Tour Golf

Previews of new products from the Valley—just released or in development.



Aegis Development is now offering a **Preferred Customer Program**. For an annual fee of $60 you receive updates to all Aegis software you own and a subscription to Visions, a newsletter with product information, technical articles and user hints. You will also be put on their press release mailing list. Additionally, Aegis has started a BBS to supply user technical support, and you will be given access to this service with a CompuServe Starter Kit and two hours free access time.

Microsoft Press has released **The Amiga**, a book designed to help you explore your Amiga. The author, Michael Boom, covers the basic concepts of video graphics, AmigaBASIC programming, electronic music, animation, and several Amiga applications programs. Excellent explanations, tested program code, and a well thought out presentation make this a worthwhile addition to your library.

Discovery Software is releasing several Amiga programs. The first is **Key Genie**, a pop-up keyboard definition program that lets you create your own keyboard macros. **Key Genie** also includes **Turbo-Shell**, an AmigaDOS enhancement that moves the most commonly used DOS into RAM to speed their execution and avoid waiting on the disk drive every time. In addition, **DX 16**, a programmable programmer's calculator, is included; this is an emulation of the HP16 calculator used by programmers. Finally, the **Disk Analyzer** is a utility for examining and altering data on a floppy disk. It includes routines for restoring damaged disks, undeleting files, and other important tasks.

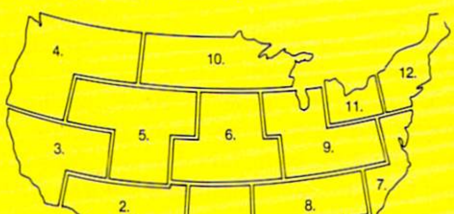
Mindscape has just released five new programs for the 64. **Uridium** is an arcade-style space war game. You must fight off a squadron of enemy Super-Dreadnought ships, saving your galactic sector's valuable mineral resources. One or two players can participate in 15 levels of play. **Trailblazer** is a maze game using soccer balls. You must move your ball through one of 20 courses or a random course. Two players may compete on a split screen.

Parallax is an arcade-style science fiction thriller combining fast action with challenging puzzles in a multiple playing level game. You are part of a routine exploring mission that must stave off an imminent alien attack on Earth. **Uchi Mata** is an authentic martial arts simulation of Judo. Players practice all of the major judo throws by playing against each other or the computer. **The Legend Continues** is another martial arts simulation. You are a Kung Fu master pitted against Ninja assassins, shoguns, warriors, mercenary soldiers, panthers and peasant villagers. Six

Continued on pg. 109

Fly to Florida!

Scenery Disk # 7 covers the entire East Coast area from Philadelphia to Miami. The Florida coastline, from Cape Canaveral to Miami, is perfect for concentrated sight-seeing. Or fly to Washington DC, where scenery details include the Capitol Building, Pentagon, and Washington Monument. Whether seeking the intellectual challenge of Flight Simulator or the brute-force fun of Jet, you'll find this latest evolution of SubLOGIC scenery absolutely breath-taking!









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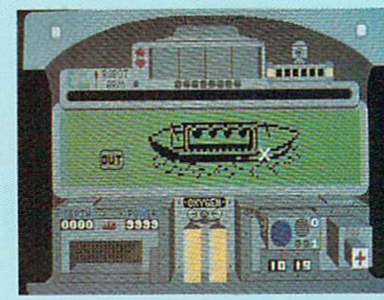


BY SHAY ADDAMS

Exploring an Underwater Maze

News and opinion from a leading explorer of those fantasy realms called adventure games.

Titanic: The Recovery Mission *is sort of like playing* The Bard's Tale *underwater.* Gemstone Healer *plays like a puzzle-style adventure.*





I almost didn't get my column written in time for this issue, but I have a good excuse: my disk drive was...lost at sea, yeah, that's the ticket. My 1571 was onboard the Titanic when it sank and I had to dive down to the wreck in a deep-sea craft and try to bring it up with a robot arm. Not only that, but the Titanic was full of other lost artifacts and treasures that I brought up and sold. I needed the money to...to keep my company afloat, yeah, that's it, I was president of the Titanic Salvage Company and Morgan Fairchild was my secretary.

Of course, this all happened in *Titanic: The Recovery Mission*, a British adventure imported by Activision. In *Titanic*, your ultimate goal is to raise the ship from its watery grave in the Atlantic—a far more original plot than find-and-kill-the-evil-wizard. And instead of rambling through the typical maze of a dragon-filled dungeon, you explore an underwater maze made up of the Titanic's staterooms, kitchens and pantries. (The rooms all existed on the actual ship and are found in approximately the same relative positions.). You get a 3D view of the current room, so it's sort of like playing *The Bard's Tale* underwater. The graphics still can't compare with those from *The Bard's Tale*, but they look better than those I've seen in most British games.

Your deep-sea craft is moved from room to room via joystick, while various keyboard commands facilitate recovering objects with a robot arm, photographing your discoveries, dropping sonar buoys to keep track of your position, and conducting other recovery operations. Puzzles center on opening locked doors in certain rooms, which involves manipulating the objects found in the wrecked ship. Sometimes you can just touch an item to open the door, but more often must find an object in one room, take it to a distant location and drop it beside another item, with which it combines to form a new object that will open the door. Occasionally you may have to send a recently retrieved treasure up to the mother ship for lab analysis before it can be used effectively.

The action is not limited to below the seas. You might get a message summoning you to a press conference, where reporters' faces appear in icons shaped like little TV sets. Select one by guiding a cursor over it with the joystick, then clicking on it with the button, and that reporter asks a question which you may answer by moving the stick to cycle through replies such as yes, no, maybe and no comment. Treat the reporters properly and you'll get good press, which helps when you try to raise funds for repairs and to continue the salvage operations.

Fundraising is accomplished by clicking on a telephone on your desk, then picking one of the people in the pictures hanging on the wall. If that person is available, he may donate more money to your company—or he may not, depending on your financial status, the value of artifacts you've recently discovered, and other factors.

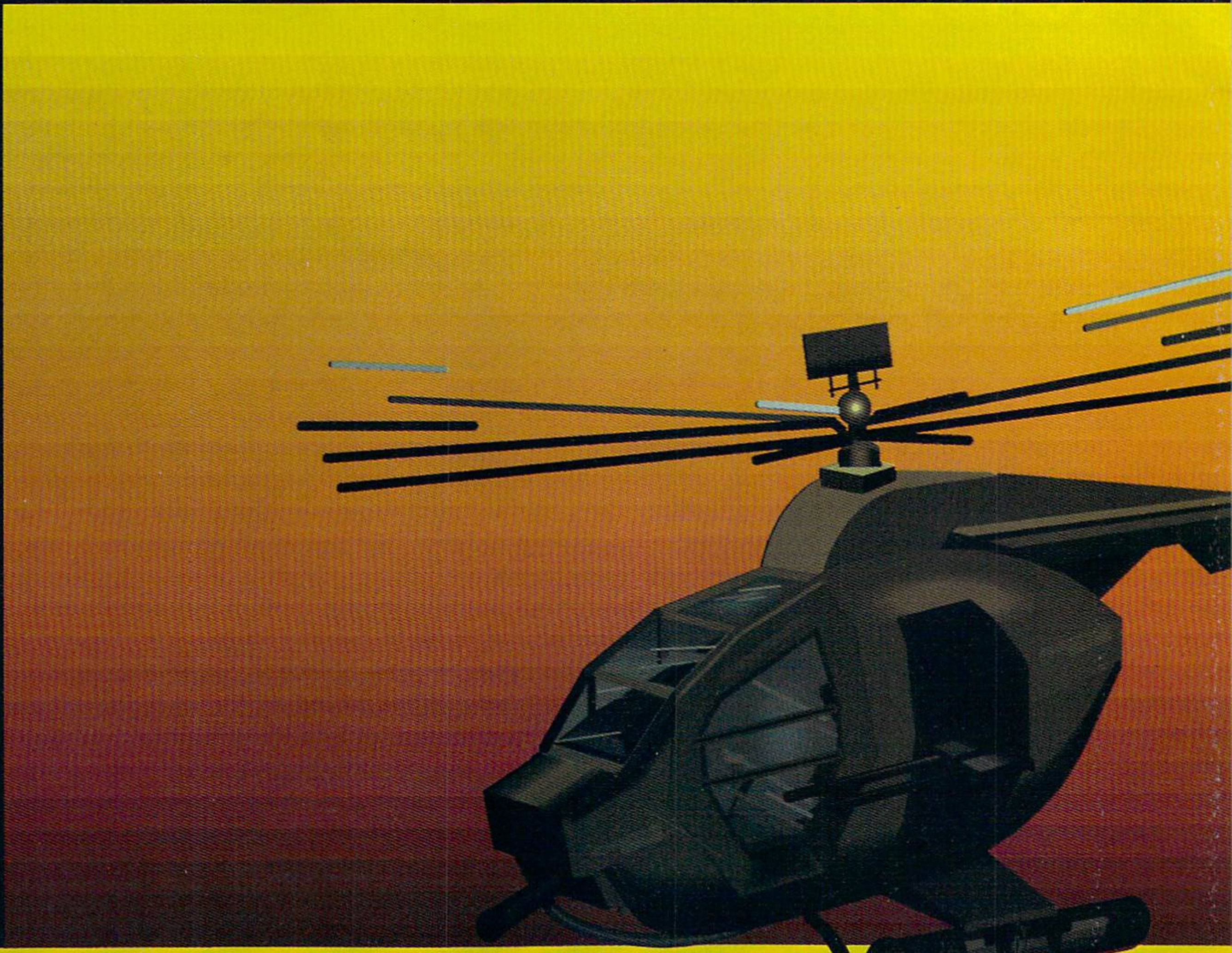
So *Titanic* is really two games, one an explore-the-maze, solve-the-puzzles scenario, the other composed of icon-driven character interaction. Icons on the program's main screen facilitate choosing between the main areas of activity: diving, press conference and fundraising. And unlike too many British adventures, this one permits you to save a game in progress. For 64 adventurers looking for a new slant on maze exploration and treature hunting, *Titanic* is the ticket.

Activision's *Rocky Horror Show* is another British import, an action adventure based on the cult film. The action takes place in the multi-level castle of Dr. Frank N. Furter, who has turned your girlfriend into stone and disassembled the machine that can save her. It's a fast-paced game in which your animated character dashes from room to room searching for the parts of the machine, dodging and ducking a cast of weirdos every step of the way. If caught, you might be stripped naked and have to go on a quest for clothes instead of clues!

Back in the U.S.A.

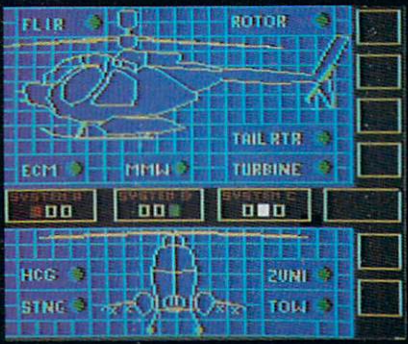
England's best is still no match for a solid American game like *Gemstone Healer*, the sequel to *Gemstone Warrior*. In *Gemstone Warrior*, you had to fight your way through a randomly-generated maze to find the gemstone, then fight your way out. In *Gemstone Healer*, you've got to take the stone back to the maze and heal it so the gemstone's magical powers may be tapped after you exit the maze again.

Continued on pg. 123



In a market full of helicopter simulations like Super Huey II, Gunship, and Infiltrator, it's nice to find a product like ThunderChopper that flies high above the rest!

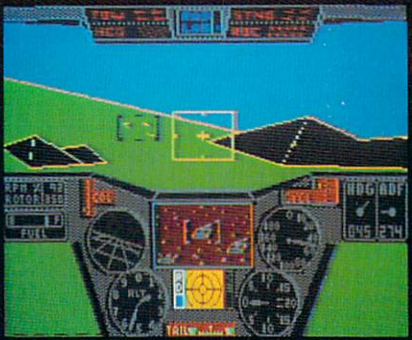
Colonel Jack Rosenow USAF (Ret.), President of ActionSoft Corp., has the experience to provide all of the helicopter action and strategy you've been looking for! ThunderChopper incorporates the most advanced graphics, flight systems, and game-playing factors to provide a sensational balance of strategy and fun:



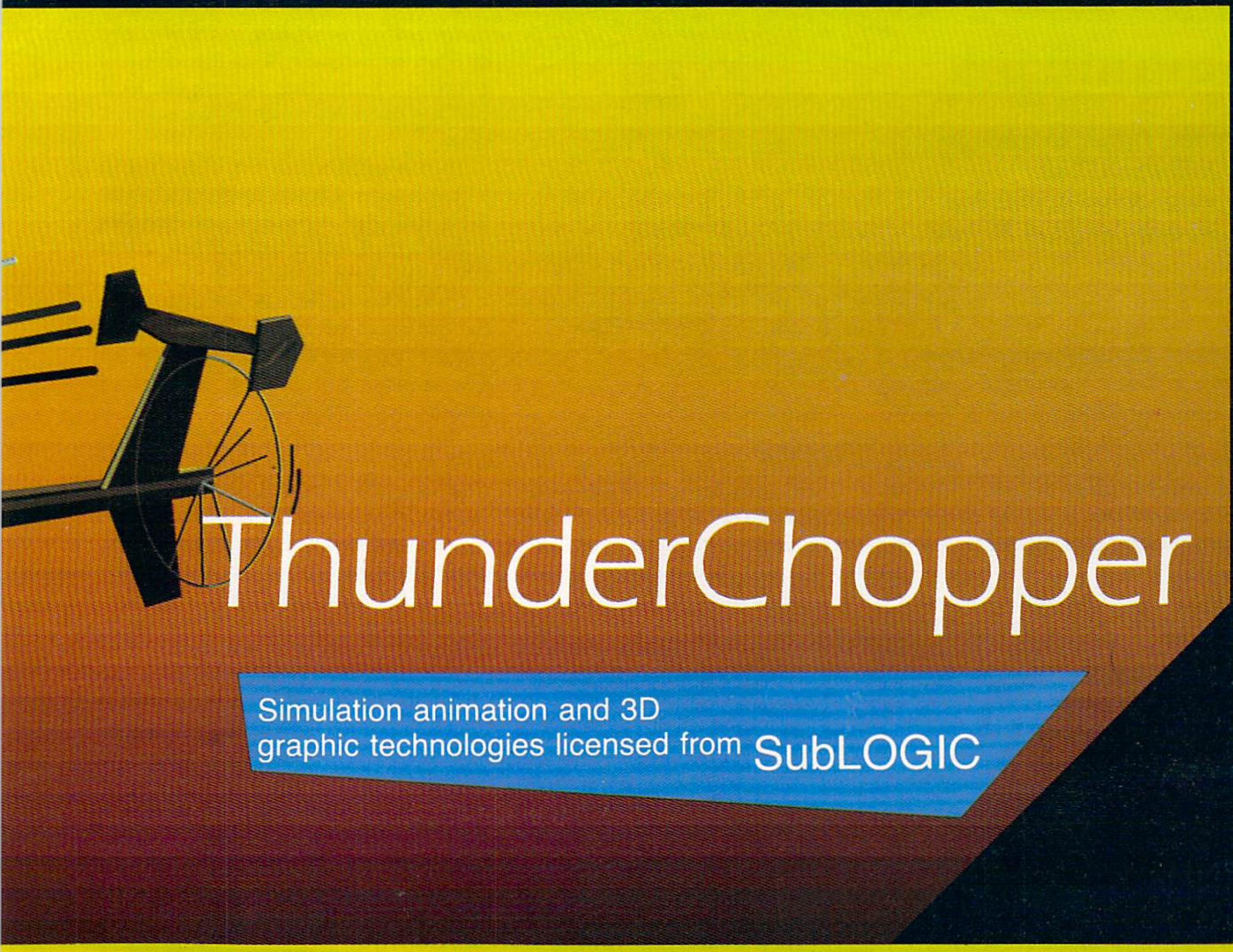
- Action-packed animated graphics include real 3D scenery and airborne threats. The competition's graphics just don't compare.

- A sophisticated instrument panel lets you scan all vital information at a glance whether performing combat, exploration or rescue operations. ThunderChopper's advanced instrumentation includes Forward-Looking Infra red, CO_2 laser radar, zoom television, and ECM. Armament includes TOW and Stinger missiles, a Hughes Chain Gun, and Zuni rockets.

- Better program and documentation design gets you up flying exciting combat missions in minutes.



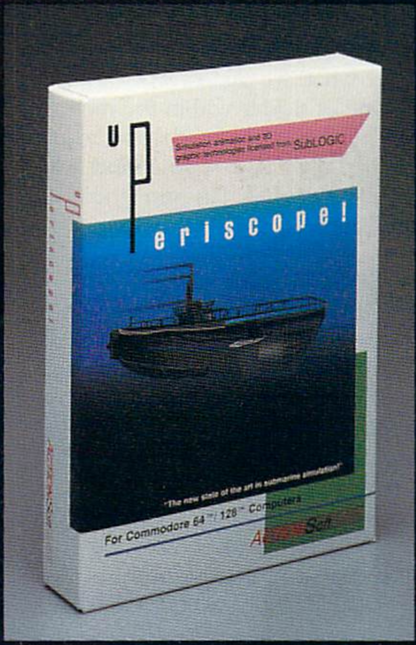
As Colonel Jack says:
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BY ROBERT W. BAKER

Inside QuantumLink

Explore the inner workings of the QuantumLink telecommunication service with network pro Bob Baker.

In a previous column, I mentioned how important it is to use meaningful headings when posting messages on the system. The capabilities of scanning message boards for specified topics now make it extremely easy to find particular messages if you know a portion of the heading or are looking for messages on a certain topic.

Well, there's now one other thing to keep in mind when posting messages to the message boards. Each of the boards is now being aged at regular intervals. The aging process is simply an automatic deletion of older messages after they've reached a set limit of time. It was implemented because QuantumLink has only a certain amount of disk space to devote to each of the message boards. The older messages have to be removed to make room for newer messages. Besides, most users generally never scan a message board for more than the last 20 or 30 messages anyway. Just be aware now that if you're reading a message that refers to an older message, the older one may no longer be posted.

Since many users post messages in more than one place, this duplication of information is wasting message space on the system and could cause message boards to be aged at shorter intervals. If you use an informative message heading and post the message in the appropriate place, then there shouldn't be any reason to post the information in another area.

The area where this seems to happen the most is the Classified section in the Mall, where everyone is posting For Sale or Wanted advertisements. Take a look sometime at the number of messages in the For Sale message areas that simply have a For Sale heading with no hint as to what is for sale in the heading. Most people don't even read these advertisements since they don't want to waste their time reading messages for things they're not looking for.



LINDA CLARK

You continually find messages posted in the For Sale message areas for items wanted, and items for sale posted in the Wanted message areas, or messages posted in both areas for the same thing. You'll also find items posted in the wrong category or in more than one category at the same time. If messages are posted in the appropriate place, it makes it easier for everyone to find what they're looking for and it saves system space, making room for more messages.

The Classified section is not the only place this occurs, but it's the most obvious there. If we all try to think about what we want to communicate and place our message in the most appropriate place, the system will be that much easier to use for everyone.

While on my soap box, here's another item that can greatly help when responding to Email received from another user. Why not include a very short reference to what you're replying about within your response message? I get dozens of messages every day and don't always remember what I've said to who. Without some kind of tickler within the message to give me a hint about what we're talking about, I don't always remember what the sender wanted. I'm sure there are others like me as well.

Hot Off the Wire

The Crossroads Cafe can be found in the Just For Fun section of QuantumLink. Users who have been on the system for a while may remember when the cafe was called Cafe Bozart. The current proprietor is Craft T, who provided me with insight as to what the Cafe is all about.

Throughout the years, a local pub or cafe has played an important role as a meeting place for locals to share their views on local and world events, politics or the arts, while sharing a cup of coffee or other refreshment. With the advent of a mobile society such as ours, the local cafe has dwindled in importance—until now.

The Crossroads Cafe was conceived as a base for free-spirited thinkers to share their thoughts, opinions and insights with others. A sort of national cafe, if you will, with a local friendliness.

Upon entering the cafe, the first stop is the Welcome announcement. I would suggest taking the time to read the text of this message, as it gives an overview of cafe customs and hours.

The Expresso Room is an informal conference area where patrons meet to share a glass of mead with the Cafe moose, dispose of their blues in the "Black Hole" installed next to the potted palm, and can take time out to pet the bar rag. This area is staffed Monday thru Saturday from 7 PM to 1 AM by an interesting group of hosts and hostesses. You can join in the current conversation or start your own.

Down the hall is the Backroom where more formal conferences are scheduled weekly, offering a range of discussion forums. Poetry Unlimited, a Writer's Forum, allows authors and poets to share their works live on-line. Writers can participate in round-robin writing, discuss the works of famous authors and poets, plus share their trials and tribulations of getting published. Topic Nights cover relationships or current events, and a Legal Forum is offered to give people a more complete understanding of the legal processes and generic legal advice.

The Cafe Message Boards provide a means of posting information for others to read. The General Notices resemble a bulletin board you might find in your local cafe, where patrons place notices as well as information about coming events in the Cafe.

Discussion Topics is the board to express your opinion on just about anything; it also provides fodder for the Expresso Room discussions as well. Reviews, Piks and Pans provides patrons with an area to post reviews on products, music, movies, television and any other product or item you feel others should or shouldn't see or buy.

The Prose board is used for posting original fiction created by Q-Link users. A Poetry board serves the same purpose

Continued on pg. 125

BY SUZANNE McCOACH AND DAN SCHEIN

Connect!

A Guide to Telecommunications Literacy

Become an on-line expert in this ongoing telecommunications tutorial.



JOHN DZEDZY

In part four of our series, we explain commercial database services and bulletin board systems.

Commercial database systems are run by companies that charge a fee for using their service. They are usually run on large mainframe computer systems and they can handle several thousand callers at one time. This means that you will not get a busy signal when you call these systems, even if other people are using the system.

The commercial database systems have features that the local BBS systems are not able to offer. For example, On-Line Airline Guide (OAG) lets you can make airline reservations and purchase tickets. Other services include checking current news from the major wire news services and getting the latest and current stock prices.

One of the most popular features of commercial databases are the Special Interest Groups (SIG's). This is an area where users with common interests exchange messages and programs. SIG's are available for all the major computer types and models along with items ranging from astrology to music.

Some services charge a surcharge or extra fee for accessing at 1200 baud. The amount of the 1200-baud surcharge varies and we suggest that you contact each of the database services directly for exact costs.

There are two types of commercial database services. The first uses the traditional ASCII Videotext service. With standard Videotext, information is sent to your computer sequentially. This means that as information is sent to your computer it is displayed on the screen. When information has scrolled off the screen, it is lost and cannot be retrieved without rereading the entire message again. Graphics are not supported on this type of system. Only the standard ASCII characters are supported so that computers of any make and model can communicate. The color of your cursor, text and background colors are determined by your telecommunications software.

The second type is called Color-Videotext, which uses the ability of your computer to produce colors and scroll screens forward and backward. Information is not displayed on the screen directly, but held in a form of buffer. This allows you to scroll backward to read information that has already scrolled off the top of your screen. Other features include pull-down menus and the use of Commodore graphic symbols. But for these features, special software is required.

Bulletin board systems are run by an individual or computer user's group and there is usually no cost or charge to use the system. Bulletin board systems are normally run on home or personal computer systems. These systems allow only one user at a time to access the system, which means that you will get a busy signal if you call a BBS that someone is already using.

Bulletin board systems have been most often compared to the bulletin board found in your local supermarket. This is a fairly close comparison. Most BBS's have message areas and also offer the ability to upload and download programs. A strong trend is for the BBS to have a theme. For example, it may be for users of one computer brand, very technical in nature, or be of an adult nature, to name a few.

This will change from BBS to BBS. Most BBS's have a local flair to them and the messages and other options of the BBS reflect on the users and the location. There are many BBS's available today and if you are interested in finding a local BBS, you should contact a local Commodore User's Group or computer store for a listing.

Some BBS systems also offer message bases that are topic specific and include an accompanying program area. These are equivalent to a commercial database's SIG's. As a general rule, all commercial database systems and BBS's offer access at 300 baud.

Some BBS systems also offer message bases that are topic specific and include an accompanying program area. These are equivalent to a commercial database's SIG's. As a general rule, all commercial database systems and BBS's offer access at 300 baud. Some BBS's offer access at 1200 baud, usually with no surcharge or fee.

Another difference between BBS's and the commercial database systems is the regular phone service charges. Whether you are calling a BBS, commercial database system or a friend, the phone charges for modem calls are the same as a voice call. This applies to long distance and local calls equally. However, commercial database systems use a series of local access numbers throughout the country. This allows almost all users to place a local call and connect with the commercial data base. Not every area of the country is covered with local access numbers for each of the commercial database systems. To find out if a local access number is available for you, check with each database service directly.

Commercial Data Bases

CompuServe (also known as CIS) is one of the oldest data-

Continued on pg. 24

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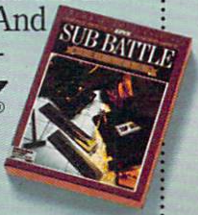
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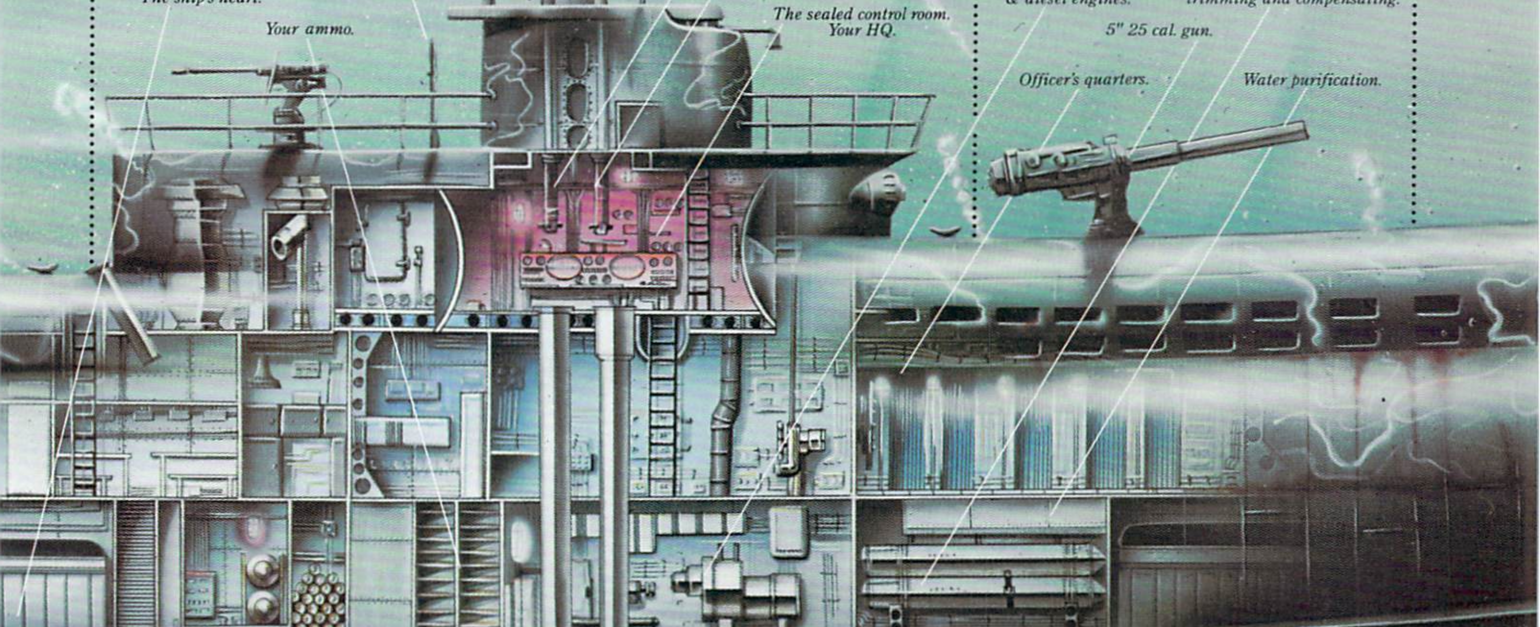
Name______________ Phone ( )______

Address______________ Age______

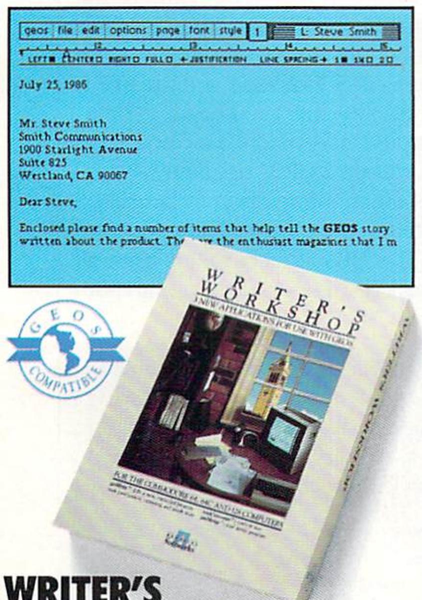
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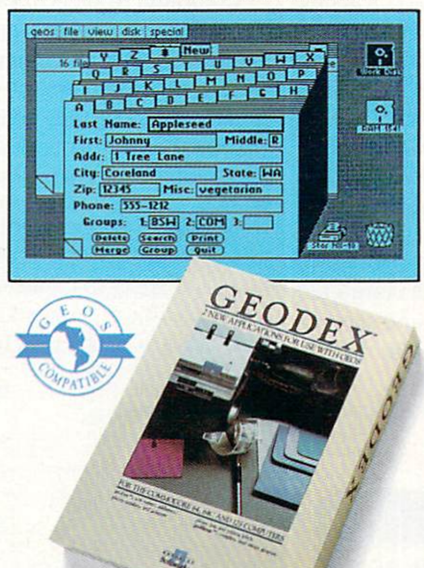


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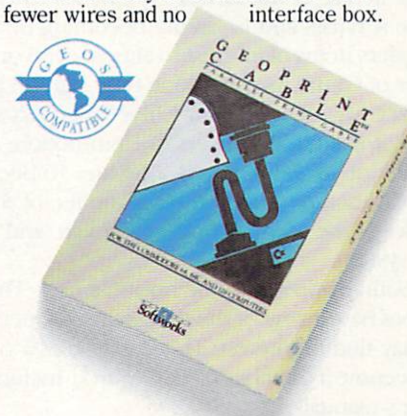
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Berkeley Softworks

The brightest minds are working at Berkeley.

Continued from pg. 20

base services available. CIS sells complete guides/books covering how to use the system. To become a member of CIS there is a $39.95 one-time sign-up fee. Included in this sign-up fee is a $25.00 credit that can be applied toward your first bill.

Delphi is a system that attracts users from a wide range. To become a member of Delphi, there is a $49.95 one-time sign-up fee. Included in this sign-up fee is a user's handbook for the system and two hours of free connect time for two evenings.

Dow Jones offers services for the business world along with items that interest the individual computer user. There is no sign-up fee to become a member of the Dow Jones network.

GEnie is one of the newer companies to enter the field of database services and is rapidly becoming one of the leaders. GEnie offers items of interest to almost everyone. To become a member of GEnie there is a one-time sign-up fee of $18.00.

PlayNet was the very first Color-Videotext services. Access to PlayNet is limited to users of Commodore 64's or 128's in 64-mode due to the required software. To become a member of PlayNet there is a one-time sign-up fee of $19.95. Included in this fee is the special PlayNet software and a user's manual for the system.

The Source appeals to the business user. This system, however, does have many of the things that the personal computer users may find of interest. There is a $52.95 one-time sign-up fee to become a member of The Source. Included with this fee is a user's manual.

QuantumLink is a Commodore-specific Color-VideoText service. To use QuantumLink you need their special software which will only run on a 64 or 128 in 64-mode. It is available at no cost. There is no sign-up fee for QuantumLink.

Two examples of Bulletin Board Services

ARB BBS is a BBS located in the Langhorne, Pennsylvania, area that has many callers both local and long distance. This BBS is operated on a Commodore 128 system. Some of the more interesting items available include a dating service. Uploading and downloading of public domain programs is also a popular feature. The number is 215/752-7841 and the BBS is available 24 hours daily at both 300- and 1200-baud.

Computer Addicts Anonymous (CAA) is a BBS located in Las Vegas, Nevada. This system is run on a CP/M operating system and is very versatile. There is much information to be gained on this BBS if you are interested in the technical areas of computers and how they work. This BBS attracts callers from all parts of the country and is available 24 hours daily at both 300- and 1200-baud. The number is 702/731-3178.

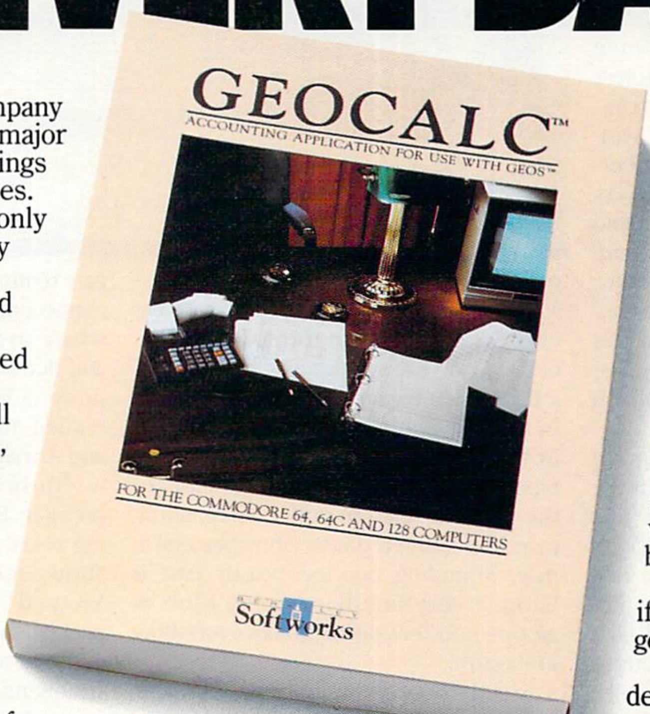
The charges for each of the services varies and is included in the accompanying chart. All times listed in the chart are local time and apply to the time zone of the number you are calling. For more information and/or to subscribe to the service(s) you will need to contact each service directly.

	Prime Rates	Non-Prime Rates	1200-Baud Surcharge	Monthly Fee	Sign-up Fee
CompuServe	$12.50/hr. 8AM-6PM M-F	$6/hr. 6PM-8AM M-F Weekends	Yes	No	Yes
Delphi	$17.40/hr. 7AM-6PM M-F	$7.20/hr. 6PM-7AM M-F Weekends	No	No	Yes
Dow Jones/News Retrieval	$54/hr. 6AM-6PM M-F	$12/hr. 6PM-4AM M-F Weekends	Yes	No*	No
GEnie	$35/hr. 8AM-6PM M-F	$5/hr. 6PM-8AM M-F Weekends	No	No	Yes
Playnet	N/A	$2.75/hr. 6PM-7AM M-F Weekends	N/A	$12.00 includes 4 hrs. connect time	Yes
The Source	$21.60/hr. 7AM-6PM M-F	$8.40/hr. 6PM-7AM M-F Weekends	Yes	$10.00	Yes
Quantum-Link	N/A	$3.60/hr.** 6PM-7AM M-F Weekends	No	$9.95 includes unlimited access to non-plus services	No

*Yearly fee of $12.00
**Fee is for Plus services only

Suzanne McCoach is Telecommunications Manager at Commodore. Dan Schein is Network Coordinator.

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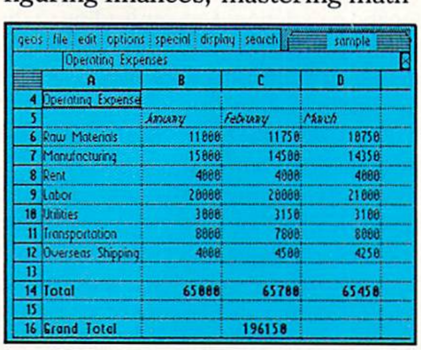


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	A	B	C	D
4	Operating Expense			
5		January	February	March
6	Raw Materials	11000	11750	10750
7	Manufacturing	15000	14500	14350
8	Rent	4000	4000	4000
9	Labor	20000	20000	21000
10	Utilities	3000	3150	3100
11	Transportation	8000	7800	8000
12	Overseas Shipping	4000	4500	4250
13				
14	Total	65000	65700	65450
15				
16	Grand Total		196150	

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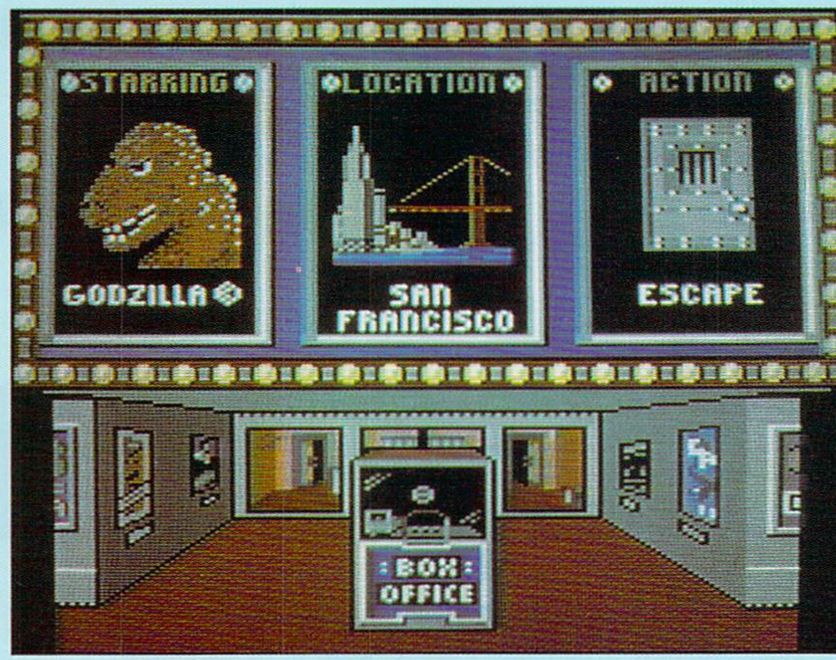
Berkeley Softworks

The brightest minds are working at Berkeley.

REVIEWED BY MARK COTONE

The Movie Monster Game

Computer: Commodore 64
Publisher: Epyx
600 Galveston Drive
Redwood City, CA 94063
Medium: Disk
Price: Not available for publication



If you're the type who has to choke back tears every time you watch King Kong™ tumble off the Empire State Building or feels heartbroken whenever you witness Godzilla™'s bubbly demise in Tokyo Bay, then Epyx's *The Movie Monster Game* is certain to be of interest to you. Drawing on the lure of those classic creature features, as well as the sympathy often felt for their beastly antiheroes, this ingenious offering allows players to actually take control of these titanic bad guys in their own personalized monster movie creation. As in many other Commodore contests, the fate of mankind is again in your hands. But in this role reversal, you would like nothing better than to close your fist and squash mankind dead.

The program consists of two stages: a structuring phase, where you set up the game to be, and the playing phase, where your design comes to arcade life. Keeping with this offering's theme, the first step is presented as if you were the producer of an upcoming Hollywood film. Here you must decide upon the setting, the star and the scenario you would like incorporated into your release.

As far as locations go, six cities have been scouted and approved. For those who prefer the more common targets, Tokyo, New York and San Francisco are available, three proven hot spots for frequent munching and crunching. On the other hand, if you'd like to tread on newer ground, Moscow, London and Paris also stand waiting for the worst.

The stars contracted to your studio range from the famous to the familiar. For copyright reasons, Godzilla, that reptilian great with fiery breath and a mean kick, is the only monster actually showcased with his stage name. The rest of the gargantuan gang are working under assumed titles. From the insectile group we have Sphectra, a wasp the size of a Winnebago, and the self-descriptive Tarantus, a hairy eight-legger with lousy manners. In the Pop Culture class one can choose from Mechatron, a transforming robot type, or Mr. Meringue, a kissing cousin to the gigantic cream puff marshmallow man that sauntered into Ghostbusters' finale. Rounding out the beastly cast is Glog, a very familiar oozing blob of gloppy goo that disintegrates everything in its path.

Exactly how your monster will pass the time while in town is decided in the final pregame step, where a storyline is fitted for your creation. This choice will serve to structure the contest, giving the player an objective to pursue while providing some sort of competitive scoring basis.

The plot choices seemed to be pulled right from the scripts of some golden oldies. In the realm of unprovoked terror, an aggressive monster can choose between the instinctive actions of feasting, flattening or fleeing, as outlined in the Eat, Berserk and Escape scenarios. Those looking for a little more motivation can try either Search, in which your surrogate roams the streets looking for his kidnapped offspring, or Destroy Landmark, where an actual city site must be located and demolished to silence a disturbingly noisy radio transmitter. When a plot is chosen, the movie package is complete, and Armageddon may begin.

To help kick off your personalized premier, Epyx has included an interesting visual transitory segment simulating showtime at the local movie house. Viewed from the balcony row of a packed theatre, the lights dim, the curtain rises and the projector flickers to life. Following a short self-serving preview of upcoming Epyx attractions, an all-prose capsulized prologue is presented, detailing the past fictional events leading to the challenge at hand. It's a clever touch that does well to introduce the action and set the situation.

From here the game begins, an affair that can go in any number of directions. The only common threads running through each and every one of these contests is the guarantee of lots of death and destruction. Otherwise, there are so many variables and options at work that the user is assured to come face to face with a few surprises in each match, even

Continued on pg. 60

REVIEWED BY BOB GUERRA

10th Frame

Computer: Commodore 64
Publisher: Access Software
2561 South 1560 West
Woods Cross, UT 84087
Medium: Disk
Price: $39.95

You would expect a computerized football simulation to be exciting. Football is an action-packed sport requiring muscle and finesse, as well as sound strategy for success. And baseball, while slower-paced than football, also translates well to the computer screen because of the countless managerial and player decisions that must be made throughout the course of a game. Consequently, there are at least a half dozen football games and just as many baseball games currently available for the 64, with new ones being announced each month.

Bowling, on the other hand, would seem to have limited potential as a computer simulation. You have a bowler, a bowling ball and ten pins. The bowler rolls the ball into the pins, trying to knock them all down. If he doesn't do it with the first ball, he gets another shot at it. Big deal.

It's funny. I felt the same way about computer golf until I played *Leader Board*, Access' first sports simulation and one of the best sports games released last year. Like *Leader Board, 10th Frame* combines superb graphics, life-like animation and realistic sound effects to create an enjoyable game that you may find addictive, even if you're not a big fan of the sport.

One reasons is the game's realism. Not only does your on-screen bowler look like Earl Anthony as he strides to the line and hooks one down the groove into the pocket, the sound of crashing pins and their spinning, rolling action as they tumble, seems to be lifted directly from video tape of the Pro Bowlers' Tour. What's more, as in real bowling, there's more than one way to roll a strike, and bowlers can compete effectively while developing a unique form and style.

Another reason why *10th Frame* works so well is the game's excellent control system that lets you position your bowler, aim your ball, and roll it down the alley with complete control over the ball's speed and the amount of hook you apply.



Because bowling focuses on only one player at a time, bowling actually translates to the computer screen much better than many team sports that force designers to sacrifice graphic quality to squeeze close to a dozen tiny on-screen athletes into the game.

When your turn begins, you may position your bowler by moving the joystick left or right. Then, by pushing the stick forward, you activate an aiming cursor that may also be moved left or right. Finally, when things are lined up to your satisfaction, you press the button and watch as a bar on the left side of the Speed/Hook Indicator quickly rises toward a small speed zone near the top of the indicator. You release the joystick button when the bar is in the area of the speed zone you require—bottom for minimum speed, top for maximum. At this point a second bar begins moving down the right side toward the hook zone and this time the button must be pressed to stop it in the right area—top for no hook, middle for medium hook, and bottom for maximum hook.

Because the bars on the Speed/Hook Indicator move quickly, it takes concentration, precise timing and good reflexes to give the ball just the right amount of speed and hook. With practice comes control, and before long you'll not only roll an occasional strike, you'll be able to pick up the spare or make the best of a bad split. In addition to the Professional Level described above, there is also an Amateur Level in which the timing of the Speed/Hook Indicator isn't as critical, and a Kids Level that allows young bowlers to simply aim the ball and let 'er roll.

Up to eight bowlers can play *10th Frame*, either individually or divided into two teams, and the cumulative score for up to five strings is kept automatically. At the end of a game you can print out the scoresheet with a single keystroke. This shows not only your score on each frame, but the level you played on as well so you don't have to leave the computer on all day to show everyone what a fantastic string you bowled.

Like *Leader Board, 10th Frame* isn't copy-protected, so you can make as many back-ups as you need with any standard copy utility. The game comes with a security key, however, that must be plugged into your 64's cassette port before the original or any of the copies can be used.

All right. So maybe bowling isn't as fast-paced as hockey or as thrilling as world cup soccer. But because bowling focuses on only one player at a time, bowling actually translates to the computer screen much better than many team sports that force designers to sacrifice graphic quality to squeeze close to a dozen tiny on-screen athletes into the game (usually, only one is under direct joystick control anyway). With *10th Frame*, Access proves once again that it's not the sport that makes a computer simulation exciting, it's the realism with which it's brought to your computer. C

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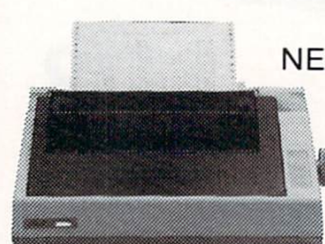
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REVIEWED BY SCOTT WASSER

Zorro

Computer: Commodore 64
Publisher: Datasoft
19808 Nordhoff Place
Chatsworth, CA 91311
Medium: Disk
Price: Not available

It's very easy to get so preoccupied battling guards, exploring screens and accomplishing tasks that you forget your real purpose—rescuing the senorita.





It's a day so quiet you can almost hear the sun's rays bouncing off the hot dusty streets. At one end of the pueblo in a small cantina, a few patrons sit sipping their beers. Things are so still that the hum of their chatter can be heard at the other end of town.

Suddenly, a woman's scream pierces the air. Her shriek reverberates as it bounces off the clay walls of the town's adobe buildings. The townspeople know that wicked Sergeant Garcia has struck again, but they are helpless to save the beautiful senorita. Garcia's soldiers are highly trained and his fortress nearly impregnable.

Or is it? Perhaps there is one man who can save the innocent victim from Garcia's evil clutches. If she is to be rescued from his fortress, it will take someone who is graceful as a cat, brave as a lion, and an artist with his sword.

It will take Zorro. And that's who you are in this adventure game by Datasoft. Wearing the black mask and cape that are Zorro's trademarks, be prepared to use your sword at a moment's notice. It's a wonderful premise for a computer game, because the idea of playing Zorro should appeal to anyone who has ever read McCulley's work or seen his hero portrayed on television or in the movies.

Zorro was the Robin Hood of California when that part of our country was ruled by Spain. He was a wealthy landowner named Don Ricardo who, hiding his true identity behind a mask and cape, called himself Zorro as he fought for freedom and justice.

Zorro was a superhero, but not superhuman. His main weapons were his lightning-swift sword, great athletic ability and intelligence. He could climb and leap like a cat to ambush or escape from a foe. Just as often, he could simply outwit his enemies. But when forced to fight, he would deftly out-duel his opponents. And before making his escape, he'd etch his trademark—the sign of the Z—with the tip of his sword.

While his enemies could never capture Zorro, Datasoft does a good job of capturing his spirit in its joystick-operated program for the Commodore 64. The object of the game is fairly simple. As Zorro, you must rescue the kidnapped senorita from Sergeant Garcia's clutches.

To do so, you'll need all of Zorro's skills. His superb swordsmanship and marvelous athletic ability are built right into the game, but in order to succeed at your task, you'll have to provide Zorro with resourcefulness and cunning.

The game demands quite a bit of both. That's because while you're trying to rescue the senorita, you'll have to work your way through 20 different screens. Each one presents its own particular challenges and each contains clues and special objects that can help you in your quest. To further complicate matters, there are as many as six different ways to leave one screen and enter another.

In order to move from screen to screen, you'll have to take advantage of all of Zorro's physical skills. There are ladders to climb, walls to scale, rooftops to leap from, and unusual trampolines to help you catapult over obstacles. You'll have to employ secret passages and all kinds of objects along the way to help you reach the fortress where the senorita is being held.

You'll also have to avoid Garcia's many patrolling guards. Most times you'll be able to sneak around them, but once in a while you'll find you have to fight to get past one. On those occasions, you'll have to draw your sword and have a duel to the death.

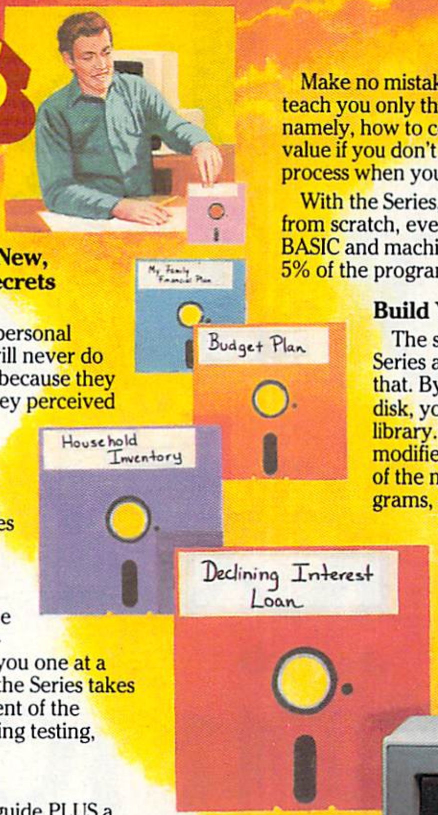
Each time you defeat a guard, you earn five points. You also earn points for finding and recovering objects and for completing various tasks. The number of points you earn depends on the length of time it takes to complete a task.

Between completing tasks, exploring screens, battling guards and searching for the senorita, there's a lot in this program to keep players busy. Each aspect of the game poses its own special challenge. In trying to complete tasks, you must first assess the objects that are available and then try to figure out what to do with them. One scene, for example, contains a bull and a horseshoe. You're suppposed to figure out that your task is to pick up the horseshoe and use it to brand the bull.

Continued on pg. 64

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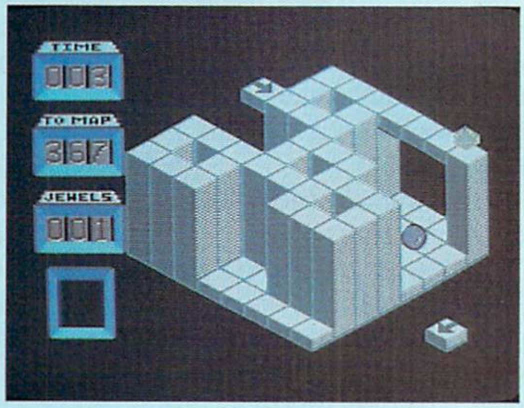
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REVIEWED BY JOHN JERMAINE

Spindizzy

Computer: Commodore 64
Publisher: Electric Dreams/Activision
2350 Bayshore Parkway
Mountain View, CA 94043
Medium: Disk
Price: $14.95

> *If you try playing* Spindizzy *using normal joystick responses, you're doomed to early retirement.*



Break out the straight jackets, boys. *Spindizzy* has just been released to America, and it's bound to drive the game-playing community bonkers.

You're an intergalactic mapmaker with an unusual task: you must explore a strange new dimension that has recently been discovered in a remote sector of space. Your only tool for this assignment is a GERALD unit (Geographic Environmental Reconnaissance Land-mapping Device).

GERALD devices are commonly used to explore alien environments by remote control. They remove the human element from possibly hostile surroundings and provide a mechanism that is totally reliable. They can also alter their form. Yes, your GERALD unit can transform into the shape of a top, a marble or gyroscope. You can keep your initial form throughout the game or change to a new form whenever you wish.

Joystick response in *Spindizzy* is great. I've never seen a 64 game before where the stick becomes such a precision instrument. If you try playing *Spindizzy* using normal joystick responses, you're doomed to early retirement. You must use the joystick as if you were handling a bottle of nitroglycerine. In fact, during many difficult screens, I tap the joystick to maneuver my vehicle to the center of a grid plate. Once I've done this, I proceed with caution and continue tapping the stick to get the GERALD unit to a desired location, or carefully begin searching the screen for the proper exit point if it isn't obvious.

Some people may think that you waste a lot of time following this procedure, but you lose more time as a penalty if you disappear over the edge of the playing grid. Pressing the fire button on the stick gives your remote-controlled unit extra speed for climbing steep hills or jumping over bottomless pits. Use this extra power sparingly because it can get you into a lot of trouble. I recommend using extra speed in short bursts followed by an immediate pressing of the spacebar to stop the movement of the object you're manipulating.

It also pays to enter a screen at a slow rate of speed. You never know what's waiting for you beyond your line of sight. This method of playing the game tends to be a little awkward at times, but it gives you the best chance of survival in this strange dimension.

Spindizzy has some unusual options and features. As you prepare to play the game, press the H key to examine the title screen and samples of the many items found throughout the landscape. I like to be able to view the many components of the game on a single screen. Unfortunately, most of these examples are stationary exhibits, with no explanation of what the items are good for.

Press one of the function keys and you'll see the present screen from a different point of view. Pressing the M key activates the map mode of the program. A blinking light indicates your present location, while yellow sectors represent the screens you've already explored. Return to the game by pressing the spacebar.

The two-player option of *Spindizzy* is quite unique. The individual using joystick port #1 controls the up and down movements of the figure you command and the second joystick controls left and right maneuvers. *Spindizzy* is difficult enough to master in the single-player mode, but this two-player challenge is mind-boggling.

Other options include the ability to change the current color scheme, an instant score update, an abort feature that starts the program over, and the option to pause the action on the screen at any given time.

The graphics of *Spindizzy* are excellent. Large grids, narrow pathways and mazes are well constructed, using bright colors that command attention. Your mode of transportation (a top, marble or gyroscope) looks sharp and moves fluidly around the screen.

There is a shortage of sounds in *Spindizzy*, but the programmer had two good reasons for this. First of all, loading 386 puzzle screens into memory at one time had to consume most of the memory available. And since *Spindizzy* isn't a shoot-'em-up game, you don't need sounds associated with that type of game.

Basically, you hear two sounds in *Spindizzy*: a lively musical score and a soft explosion when the marble flies over a cliff and strikes solid ground beneath it.

Before I wrap things up, I'd like to pass along some tips for playing the game.

1. As you select the right icon for playing the game, consider these factors. The top and gyroscope have a slender structure beneath them. This stalk proves an excellent reference point for centering the figure on a grid plate. I must warn you, though, that the joystick is extremely sensitive whenever you assume either of these two shapes. The marble seems to be a heavier figure, making it a lot simpler to control. Use the marble to travel over wide playing surfaces. I also use the marble to jump over gorges because it's easier for me to control once I reach the other side.
2. As you begin exploring the many screens of the game, it pays to take advantage of the map option in the program. You can save a lot of time using

All I'll say about the secret level is that it's called the Water-Maze, and being in the right place isn't enough—you must also be there at the right time.

and move on to level five. Here, as on level one, the only real enemy is gravity. But this time, by some cruel twist of fate, it has reversed itself. Your marble now rolls up hills on its own and must be forced down inclines. This takes some getting used to but, fortunately, there's a way to improve your chances of getting through this one alive. There are two small balls rolling around the maze that, if caught, can give you several seconds. Catch them—you'll need every second you can get.

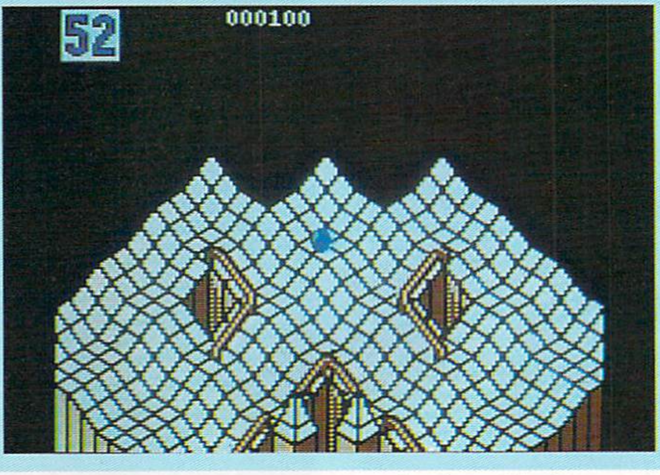
The final level is where many players will be tempted to throw in the towel. Just when you finally think you have a chance of reaching the finish line, the raceway begins to disappear from beneath your marble and reappear up ahead. The only way to successfully maneuver through the last twisting portion of this level is to time your moves so you roll onto new sections as they appear and off again before they're gone.

Although these are the six official levels, there is yet another secret level which is much harder to conquer than it is to find. All I'll say about the secret level is that it's called the Water-Maze, and being in the right place isn't enough—you must also be there at the right time. Be warned, however, finding it is only the beginning of your troubles.

Marble Madness can be played solo or head-to-head against another player. In addition to colorful 3D graphics, the game features great music and sound effects which are sometimes amusing, sometimes annoying, but always true to their arcade counterparts. About the worst thing that can be said about *Marble Madness* is that you have to wait close to 35 seconds for each level to load.

REVIEWED BY BOB GUERRA

Marble Madness



Computer: Commodore 64
Publisher: Electronic Arts
1820 Gateway Drive
Redwood City, CA 94063
Medium: Disk
Price: $29.95

Electronic Arts has earned a reputation not only for developing and distributing some of the best entertainment software around, but for providing first-rate documentation with their programs. Usually their manuals are as entertaining as they are informative, and go far beyond simply explaining how to use a program. That's why it came as a shock that *Marble Madness* is packaged without a manual of any kind. All you get is the double-sided game disk and the Command Summary card that briefly explains how to load the program, where to plug your joystick or track ball, and which keys to press to get the ball rolling.

After playing for a couple of minutes, however, it all begins to make sense. *Marble Madness* is an arcade game—the first one ever licensed by Electronic Arts. And whether you've ever played the coin-op version, the experience is the same as if you just walked up and deposited a quarter.

For those of you who've never had this pleasure, all you have to do once the game starts is to guide your marble from its starting point through a bizarre three-dimensional maze to the finish line before time runs out. Unfortunately, there are a number of obstacles between your marble and the finish line.

First and foremost is gravity. As in the real world, gravity has the effect of making rolling objects, such as your marble, roll toward the lowest point. This means that you must give your marble an extra burst of speed (by pressing the fire button) to make it climb steep inclines and quickly apply the brakes by steering in the opposite direction when you roll down a hill and dangerously close to an edge. If your marble suffers too great a fall, you don't lose a game life, but rather some time, which in *Marble Madness* can be just as valuable.

Just when you finally think you have a chance of reaching the finish line, the raceway begins to disappear from beneath your marble and reappear up ahead.

On the first of the game's six levels, gravity is the only obstacle to contend with and usually poses no problem even to first- time players. The second level introduces Steelie, an evil computer- controlled marble that tries to block your marble's path and slow it down. If you're quick enough, you can out-maneuver the spherical troublemaker and even receive a bonus for making it plunge off the nearest ledge. Even if you go over the side with it, you're better off getting rid of Steelie quickly rather than wasting a lot of time trying to dance your way around it.

Once you make it past Steelie, you'll have to steer your way around a couple of creatures which can only be described as walking Slinkies the color of lime Jello. If they touch your marble, it will be momentarily stunned and, if you're not careful, these Marble Munchers will swallow your marble whole. Another level two problem is a sunken depression that your marble must travel through just before reaching the finish line. Try to go around it and you're bound to roll off the edge. Plow through the middle and you'll promptly be deposited down a shoot to nowhere. Slip along the rim of the depression just right, however, and gravity will take over and guide your marble along the correct path to the finish line.

Level three isn't particularly difficult, even though it introduces a new enemy —green puddles of slime. If you roll into the slime, your marble will dissolve. Luckly there are only two puddles to contend with and these are easily avoided. It is important to get your marble through the third level quickly.

Starting with the end of the second level, any time that is left on the bonus clock when you reach the finish is added to the next level's starting time. One way to shave a second or two off your level three time is by letting a mechanical wave pull you along for a short stretch before rolling down to the finish line. Even if you don't save a lot of time by surfing the wave, it makes the third level more fun.

The fourth level is where you begin to realize how the game got its name. If this one doesn't drive new players mad, nothing will. Just when you think everything is going along fine, a Humming Hoover pops its head up over the edge of a narrow pathway and inhales your helpless marble into its waiting vacuum nozzle mouth.

If you manage to slip past this adversary, you still have to roll by sections of the raceway with round projections that pop out at random to knock your marble for a spill. Level four is also home to the dangerous Hammer Heads that try to pound your marble. The key to surviving both of these obstacles is timing. However, a little practice is all it takes to learn the patterns.

Now that you've learned to battle the force of gravity and deal with a variety of enemies, it's time to forget everything

short cuts to reach a specific location.

3. Be careful as you exit a screen on a downhill grade or traveling up a steep slope. This is the perfect setup for a hidden trap which you can't see until it nails you. Use a little common sense when you encounter this scenario. Automatically reverse the motion of the stick as you exit the screen to slow yourself down. You can also press the spacebar to stop the motion of your unit entirely when you enter the next screen. By following either of these procedures, you shoudn't end up flying over the edge of a tricky grid hidden beyond your range of sight.

I also use the spacebar to stop the mechanism I'm controlling after I leap over a pit. You must increase your speed to complete such a leap, and it's hard to control the figure once you've reached the other side.

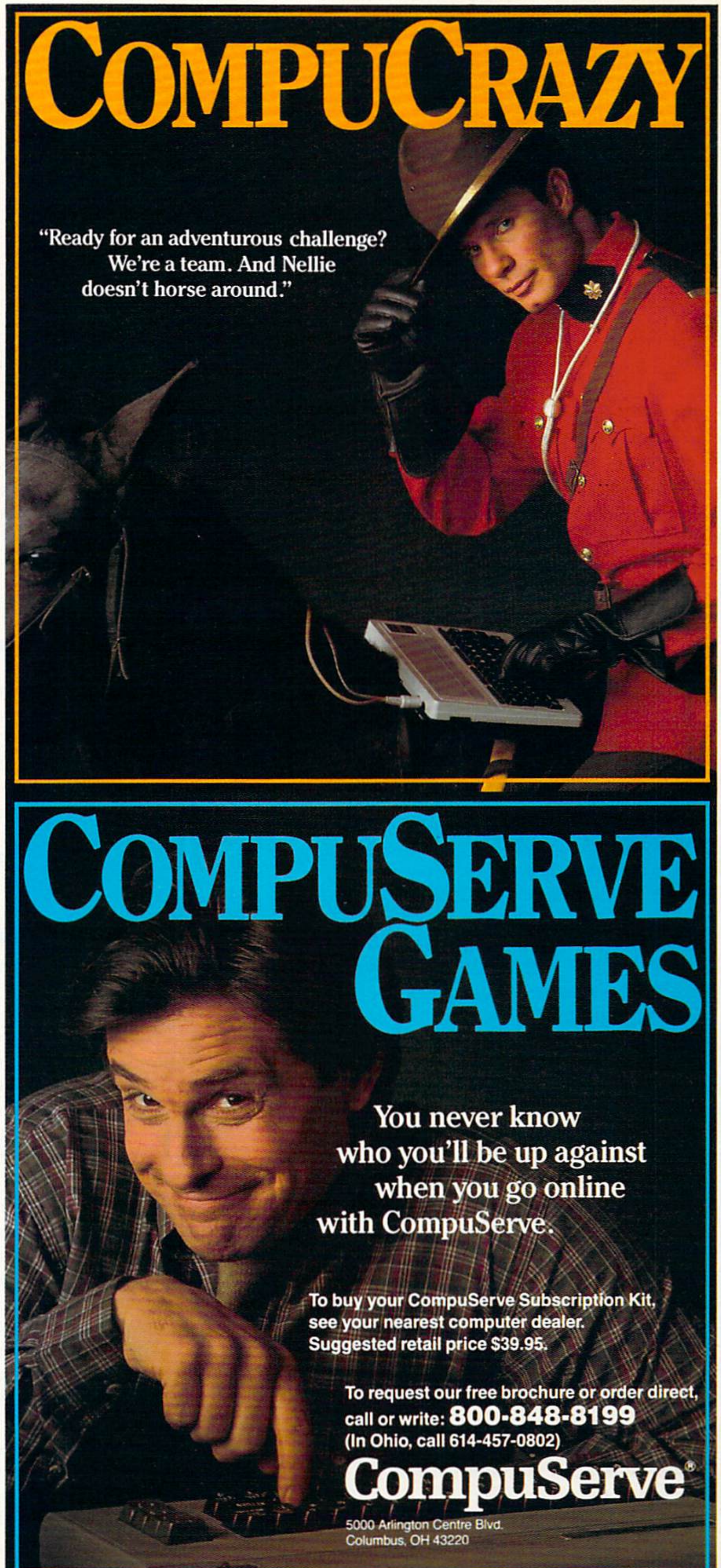
4. A wise player should travel to his right as he begins playing the game. Time passes slowly in this region, making it an ideal laboratory for testing joystick responses and strategies. You can also gather jewels in this area to extend your game time.

5. Always remember that time is your worst enemy in *Spindizzy*. With 386 screens to explore, I work at conserving as much time as possible. You can also extend the length of the game by gathering alien jewels that appear on many of the screens. Just don't waste any more time on a screen than is necessary.

Spindizzy, a British import being marketed in America under the Electric Dreams label by Activision, is an extraordinary program for many reasons. Even though *Spindizzy* is similar in many respects to *Marble Madness*, it's still a refreshing alternative to the sea of shoot-'em-up games and adventure programs on the market today.

I especially liked the program's sharp appearance, energetic music and joystick sensitivity. And many parents will approve of the non-violent nature of the game and its ability to improve a child's hand/eye coordination.

Personally, I'm convinced that *Spindizzy* is a form of English revenge. After all, didn't we inflict the *Chinese Juggler* madness and the *Puzzle Panic* plague on them in recent years? If *Spindizzy* is a form of punishment, send some more frustration and insanity my way. ■



REVIEWED BY MARK COTONE

Ace of Aces

Computer: Commodore 64
Publisher: Accolade
20833 Stevens Creek
Boulevard
Cupertino, CA 95014
Medium: Disk
Price: $19.99

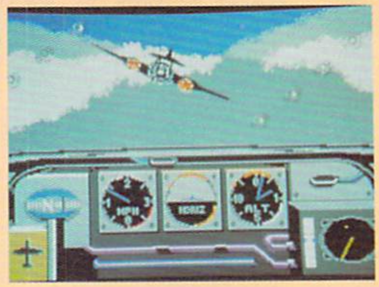
During World War II when the Nazis were doing their best to catch a second wind and regain the strangle hold they had put on Europe, one of their biggest fears was the Mosquito. No, not the insect, but a different kind of pest, one with a much deadlier sting. It was officially known as the De Havilland Mosquito—a legendary British RAF fighter bomber that still stands as one of the most versatile aircraft ever designed.

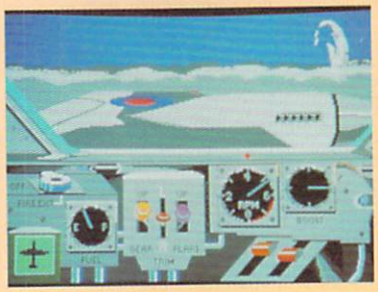
An aptly named fighting machine, this gutsy ship was capable of ruling both land and sky with blazing speed, precise maneuvers and a potent ammunition load. It was England's aerial savior, helping to stave off surrender and turn the tide of war.

In Accolade's *Ace of Aces*, you are granted the chance to slip behind the stick of this flying paragon to relive a piece of history. Your mission is one of utmost strategic importance, reserved for only the most seasoned and fearless of pilots. Germany has launched a brutal offensive on London, and the city is about to buckle. The enemy must be hit at its core, and you and your Mosquito have come to the rescue.

After taking off from your London base and soaring across the English Channel, you move into enemy airspace to attempt a four-pronged attack. Below, two ground targets have been designated for destruction. A fleet of enemy U-boats are currently preparing to leave their pen to converge on Allied convoys and close off the waterways. They must be confronted and destroyed to keep the supply lanes open. Also, a POW train en route to Berlin must be stopped. This bombing run is especially difficult since the train must be disabled without damaging any of the prisoners' boxcars. A couple of feet either way could spell disaster.

In the air, your sights are set on two other threats: a squadron of enemy bombers and a handful of V-1 Buzz Bombs. Both must be intercepted and obliterated before they reach their target city of London. The odds aren't in your favor, but all Allied hopes ride with you. Successfully complete this squadron mission, surviving the dozens of dogfights that are sure to be encountered along the way, and you will have earned the distinguished title as Ace of Aces.





The always tricky and timeconsuming routines of taking off and landing have been done away with altogether.

With this program, Accolade again exhibits its designing genius by capturing the Mosquito's unique flying experience with sensorial accuracy and engrossing gameplay. The player, taking on all responsibilities of a full four-member flight crew, is treated to a variety of screens and situations which together recreate the on-board sensation with stunning authenticity.

From the pilot's seat, a full assortment of working gauges and dials frame the cockpit view. A yoke waves back and forth in the foreground, coinciding with joystick tugs, as the aircraft is maneuvered into position. Your main objective will be to reach the target sites, but your attention is sure to be diverted. All too often an enemy fighter will cross your path, size you up for the kill, and initiate some thrilling dogfight sequences. These air battles are a game of wits and guts, hide-and-seek challenges that soar through dense blankets of clouds. It will take a cool hand and an eagle eye to dispose of the enemy. Repeated enemy hits will sustain damage to your craft, restricting equipment and mobility.

To keep the Mosquito flying in top form, the player must also take on the job of Engineer. These duties can be performed by switching to a bank of controls positioned on both the port and starboard side of the cabin. Here, looking out at a spectacular view of the cloudy skyscape as it floats past wing and propeller, the craft's speed can be regulated by adjusting the throttle, boost, flaps and landing gear. Keeping the engines operating at peak efficiency is an absolute necessity. For in an effort to keep the plane lightweight, not even an extra gallon of petrol has been stored. Frugal fuel consumption is your only ticket home.

Of course, even the most advanced craft would be rendered useless without some direction. To find out where to go and how to get there, a Navigator's table can be accessed, complete with overhead lamp and intelligence maps. Here you can study positioning, upcoming weather patterns, target locations and enemy strengths. If and when a ground destination is reached, the player quickly dons his Bombadier's cap, cranks open the bomb bay doors, and zeros the enemy's subs or train into his sights. Then with a simple press of the button, it's bombs away! Hits and misses are graphically signalled with full fiery explosions.

This contest is backed by documentation that is both clear and complete. A short instructional Quick Card is provided for those who choose to take to the air without ground school, but a more comprehensive booklet is on hand when it comes time for serious business.

The game itself wastes little time getting the pilot airborne. The always tricky and timeconsuming routines of taking off and landing have been done away with altogether, allowing the game to commence with the Mosquito in the middle of some moderately congested enemy air space. From here, the action unfolds

Continued on pg. 62

REVIEWED BY BOB GUERRA

Amnesia

Computer: Commodore 64
Publisher: Electronic Arts
1820 Gateway Drive
San Mateo, CA 94404
Medium: Disk
Price: $39.95



JIM OWENS

You wake up in a Manhattan hotel room. You have only one dollar to your name, no clothes, and, worst of all, no memory. Gradually you come to realize that you're a wanted man. The police are hot on your trail for murdering a guard while escaping from a Texas prison. Unfortunately, the police aren't the only ones who'd like to get their hands on you. There's a mean-looking Texan in the lobby wearing a Stetson and packing a pistol. He calls you Johnny Boy and insists that you rush up to the second-floor chapel to tie the knot with his daughter.

This is the miserable situation you find yourself in at the opening of *Amnesia*, an all-text adventure from Electronic Arts. From here the outcome of the story is up to you. You may try to hide among the teeming masses of New York as you search the city for clues to your past, or you can get married, move to Australia, and herd sheep for the rest of your life, never knowing your true identity or how you wound up in that hotel room in the first place.

These are just two of *Amnesia*'s possible plot twists. Others include getting shot between the eyes by the Texan for dawdlin' or being mugged and knocked unconscious on the street, only to end up back in a Texas jail where you'll eventually be executed by a firing squad. All these storylines are are useful to know because along the way, dreams and flashbacks provide meaningful insights into your past.

As in real life, your success with *Amnesia* will depend on how well you can use available resources to solve problems and take care of yourself. As you play, time passes and, just as in real life, you'll find it necessary to eat and sleep on a regular basis to keep up your strength. Once you figure out how to get some clothes and make it out of the hotel without ending up dead or married, finding a safe place to sleep at night and a way to eat regularly with no money can be a major problem. Fortunately, *Amnesia* comes with an address book, a Visitor's Guide to New York City (compliments of the Sunderland Hotel), an X-Street Indexer, and a street and subway map to Manhattan.

Amnesia's *designers have crammed 4,000 Manhattan locations including 650 streets, 3,545 intersections, 94 subway stations, and 200 New York landmarks onto the adventure's two double-sided disks.*

If you manage to beg, borrow or steal the 75¢ train fare, the entire Manhattan subway system is at your disposal. You should consult the subway map before entering the station, however, because once you reach the train platform the subway cars pull in, open their doors momentarily, and then pull out again without any player input. If you fail to board the train in time, you have to wait for the next one. Similarly, if you're not alert while riding the subway, it's easy to miss your stop and be forced to backtrack. Thus, the subway not only provides an excellent way to get around New York, its real-time operation adds to the feeling that you're lost in a big fast-moving city.

Amnesia's designers have crammed 4,000 Manhattan locations including 650 streets, 3,545 intersections, 94 subway stations, and 200 New York landmarks onto the adventure's two double-sided disks. Just as important, the flavor of the city's many neighborhoods has been realistically recreated. In the Bowery, for example, you'll find deserted tenements while the Upper East Side is home to many museums, art galleries and elegant town houses. Even the types of characters you meet roaming the streets of Manhattan reflect the city's diversity.

Whether you're talking to other characters in the adventure or simply entering commands, *Amnesia*'s sophisticated parser can interpret over 1,700 words. Commands can be entered as simple two-word phrases (OPEN DOOR) or complete and compound sentences. For instance, you might type ENTER THE SUBWAY AND BUY A TOKEN THEN GO THROUGH TURNSTILE. Because of the program's extensive vocabulary and its ability to understand a variety of sentence structures, error messages asking you to rephrase your command are rare. And like a good book, *Amnesia* is hard to put down once you've read the first few pages (screens?).

Since it's impossible to finish this type of game in one sitting, you're allowed to save up to three games in progress on a separate formatted disk. If you like to explore several storylines simultaneously, simply use additional save-game disks. Once you've reached the conclusion of a game, you'll receive scores for your ability to survive, your skill as a detective, and how much you develop as a character. In addition, depending on the amount of detail you are able to recall about your past, you are given an overall rating that, at least for your first several games, will probably be totally forgettable.

For anyone who is intrigued by the text adventure genre but is turned off because most of the available stories seem to be written for science fiction or dungeon-and-dragon fans, *Amnesia* offers a refreshing change of pace. Its novel-length manuscript is well written and aimed squarely at adult readers. Don't get me wrong— it's not that *Amnesia* is strictly an "adults only" piece of software. It is, however, one of the first works of interactive fiction that deals with mature themes like traditional fiction does. In this way *Amnesia* helps to legitimize interactive fiction as a valid medium for writers to work in, and also proves that you don't have to be under the age of 15 to use a computer for entertainment. ■

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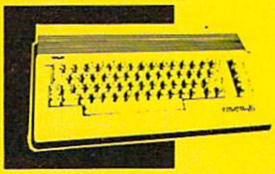
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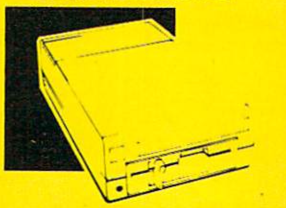


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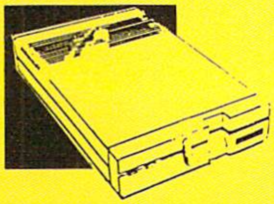
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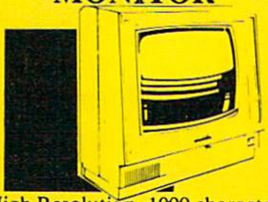
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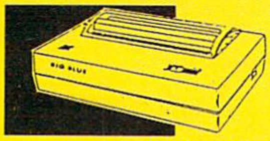


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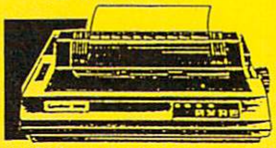
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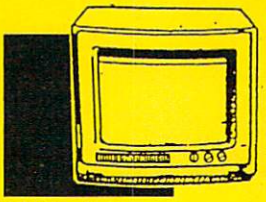


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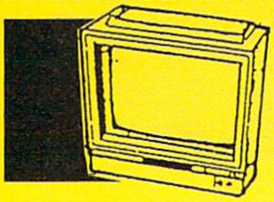


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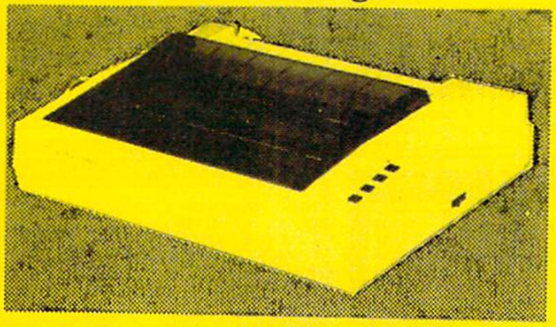
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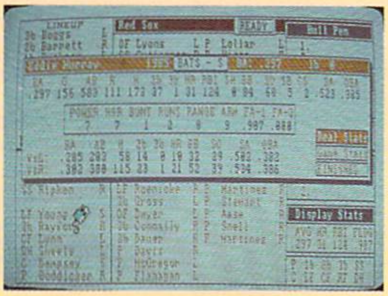
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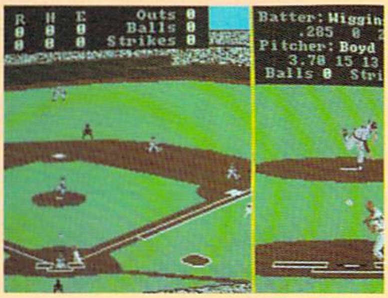
REVIEWED BY MATTHEW LEEDS

Earl Weaver Baseball

Computer: Amiga
Publisher: Electronic Arts
1820 Gateway Drive
San Mateo, Ca 94404
Medium: Disk
Price: Not available

In essence, when you play against the computer, you are playing against Earl Weaver.





Alright folks, grab a seat, a bag of salted peanuts, a hot dog with mustard and a can of soda. It's time for *Earl Weaver Baseball*. This baseball simulation has everything a dedicated baseball fan and computer gamer could want. Arcade action? You got it. Statistics on everything from ERA's to RBI's? You got it. Great graphics and stereo sound? You got it.

Earl Weaver Baseball combines strategy with arcade-style graphics, stereo digitized sounds, split screen viewing of the action, and the innovative use of artificial intelligence techniques to create a most ambitious baseball simulation for the Amiga. There are three modes of play: manager mode, in which the emphasis is on the strategy of the game; action mode, in which you play in an arcade style environment with a point of view behind and above the home plate; and auto mode, where the computer plays both teams against each other based solely on the stats.

You may select any of the 26 major league stadiums to play in or you may design your own. You can set the distance to the fences, the fence heights, the type of playing surface, wind conditions, and so on. After you've decided on the characteristics of your design, the program creates the stadium in full splendor.

You can also select any of the major league teams to play with. The line-up is selected by the computer or you can create your own. You'll see all the stats for each player on-screen as you make your decisions. You can also draft players from one team to another and create all-star teams. The stats are from the 1985 playing season, but Electronic Arts is planning to produce data disks with stats from the current and future seasons, as well as data disks with famous historical teams from the past. If you're not certain which player to put in a particular position, ask Earl. The program will make a a selection for you based on the strategies of Earl Weaver, the former manager of the Baltimore Orioles.

The game is packed with extra features. After any play, you can request an instant replay with slow-motion and single frame/freeze frame. The camera angle is different, with the point of view changing to capture the portion of the field where the action is taking place, and a much closer look at the action. You can check the wind direction and speed, put the radar gun on a pitcher to check his fastball, print out the stats for any player, any game, any team, and call plays in real time during the game.

All the standards are in as well. You can practice your batting, pitching and fielding skills prior to playing a game. There are options to use a mouse, joystick or the keyboard to control action during a game. A player's skill level can be set to allow for handicapping. This can affect a player's fatigue resistance, speed at running bases, batting and fielding effectiveness, and/or pitching skill.

Electronic Arts' Don Daglow and Eddie Dombrower had several meetings with Earl Weaver over the course of designing the game. They discussed Earl's strategy for managing a team, as well as his ideas on what action to take for virtually every eventuality during a game. They've taken his experience and created an expert system, installed inside *Earl Weaver Baseball*, that is available to give a player advice in any situation. That expert system is also used to guide the computer's playing when you play against the computer. In essence, you are playing against Earl Weaver when you play against the computer.

A great deal of attention was also paid to the physics of baseball. When a pop fly is hit, you can track the ball by watching the shadow on the field. When a long drive is hit, you get a real feel for how far the ball will carry by watching the arc it follows. Attention has also been paid to the small details that make a game feel real. This is the first sports simulation in which the players are ethnically correct in their display on-screen. When players slide, you can see the dust kicked up in front of them. The sounds of the stadium are real and add to the flavor of a real game.

This is one of the first games for the Amiga to require 512K to operate. Electronic Arts believes that this will be a trend in Amiga software.

I had an opportunity to speak with Earl Weaver during the development of the game. He offered several comments regarding the design, play and strategies he had suggested to Electronic Arts regarding *Earl Weaver Baseball*.

On the statistical side of the game: "In this game you will know what a player can do, since they use last year's [1985] stats. There will be leagues set up around the country, like rotisserie baseball, in neighborhoods and such. Some rules will be needed to control the line-up so you don't use the same pitcher every game."

On the artificial intelligence portion: "See, if you're by yourself you can play a game with me. And if you're playing a game and you're not sure what to do, you can ask me for help. I give advice, and if they do it and it turns out wrong, it'll be just like in the papers."

On designing your own stadium: "I love an enclosed park, a double pavilion and bleachers, and natural grass. I like a park where the outfielder can get up above the fence. It takes an outstanding catch to do it, but they're done, where they go over the top to bring it back. Seven feet would be about right."

On choosing a player for fielding or hitting: "Ideally you want both, and that's what you strive for. It's a question that can't be answered."

On bringing the infield in: "The infield is in or out early in the ball game, first, second and third innings. Never in with men on second, third, no outs, never bring them in until late in the ballgame. But scores dictate. If we're talking 3-0 in the fifth, you might have to. No... I wouldn't."

On stealing bases: "It has to be successful 75% of the time to do some good. If it's 50% and for every one you put on you take one off, it ain't worth a damn. Now we know that. You should steal only with someone whose stats are good enough."

On rundowns from the offensive point of view: "My job is to get him out with one throw. So I start running him toward you as fast as I can. When he can't stop, I give you the ball and you tag him out. That's how simple a rundown is. You see guys throwing the ball back and forth to one another, it's mistakes in judgment, they just don't get him running in one direction fast enough."

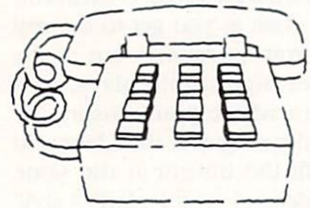
On a tired pitcher: "Velocity. You know we've got the radar gun now. That's scientific. Go on from 88 MPH to we'll say 87 early in the game down to 81, 82. Wildness, definitely. That's the biggest sign of fatigue involved."

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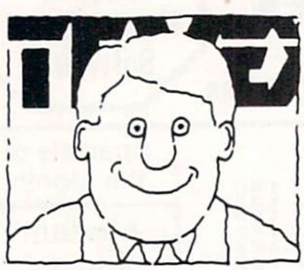
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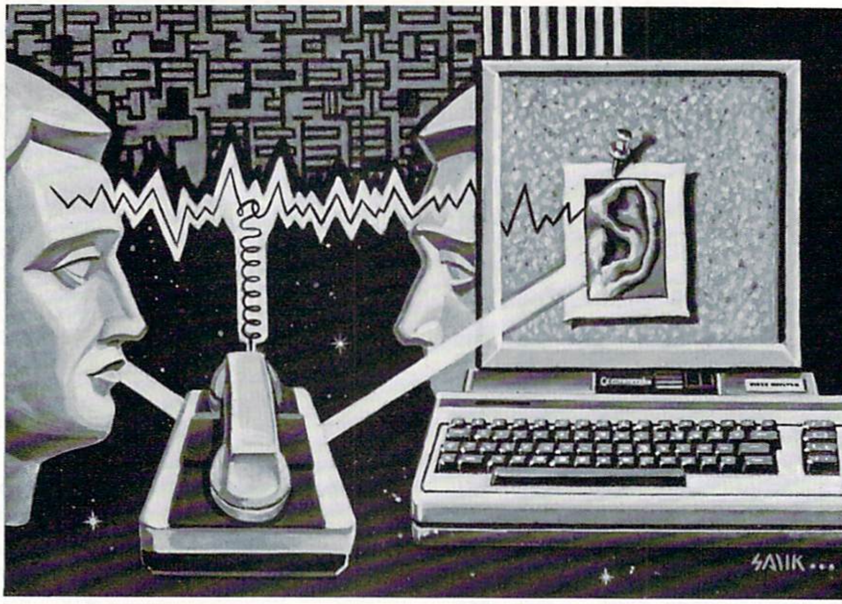
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REVIEWED BY DOREEN SCHEIN

Syntech Bulletin Board System Construction Set

Computer: Commodore 64
Publisher: Kira Corp.
P.O. Box 129
Kutztown, PA 19530
Medium: Disk
Price: $49.95



ED SAUK

Now users who do not know computer programming can create their own personalized bulletin board program.

Bulletin board programs usually come in one of two categories: programs that are not user modifiable and programs that are user modifiable. The user-modifiable programs are the best, but they require you be familiar with computer programming. This means that if you are not familiar with computer programming, you will not be able to make the necessary modifications.

However, the *Syntech Bulletin Board Construction Set* is different. It is a construction set, which means users who do not know programming can now create their own personalized bulletin board program.

The instructions for setting up, modifying and operating the program do not come in a manual. Instead, they are on the program disk. The main menu gives you the option to list the instructions on a printer or view them on-screen. The instructions are broken down into six parts: the forward by the author, an introduction to the bulletin board system, loading the program, general information, getting on the bulletin board, and the description of commands. There are a few areas where the instructions could use a bit more detail, but for the most part, the instructions are clear.

Some of the features you can build into your BBS are a SYSOP page with an option for specific hours and an option to automatically hang up on profanity (sometimes an unfortunate necessity). Each user has their own individual password and access level, but a general system password with SYSOP-definable hours is unique. This is good if you only want certain people to have access during specified hours. During this time, if a user calls and does not know the special system password, he or she will not be able to gain access to the system. Normal individual passwords are still active in addition to the system password.

Uploading and downloading are available using punter, xmodem or ASCII protocols, and users can be given any of 11 different access levels to the system. The privileges each access level has are set when you construct your own BBS. This is important if you are going to have someone help maintain the system or if you're going to be away from home for a few days.

You can have from two to four boards on a 1541 and up to 25 subboards on an SFD 1001, each with their own uploading and downloading areas. The system has E-Mail that allows users to send mail to other users on the system. The system will then notify each user as they log on if they have any mail waiting.

Another interesting feature is the polling option. The SYSOP can set up a poll and the users can take the poll as well as read the other users' answers to the poll. A built-in software clock and calendar keep track of the current time and also the time a user logs on and logs off.

The main menu automatically changes to show only the options a user has access to. Each access level has a time limit and the system logs the user off if that time limit is exceeded. These time limits are set by the SYSOP. If a caller hangs up, the system knows it and resets automatically. All of the more common BBS features are also present, including things like feedback to the SYSOP and listings of other BBS phone numbers.

The program supports the Commodore SFD-1001 disk drive, the 1541 disk drive (including most compatibles), 1571 disk drive, dual drives and almost any combination of these drives. The program supports the Commodore 1650, 1660, 1670 and Hayes-compatible modems.

Overall, this is a very nice program that will allow anyone who wants to try their hand at operating their own BBS the chance. The few flaws I found should not interfere with the program's performance in any way. The only time these will show up is when you construct your own BBS for the first time.

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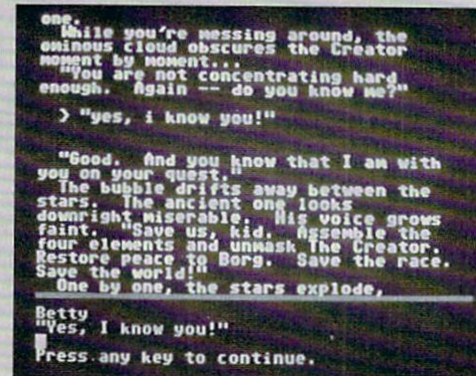
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REVIEWED BY GARY V. FIELDS

Breakers

Computer: Commodore 64
Publisher: Broderbund
17 Paul Drive
San Rafael, CA 94903
Medium: Disk
Price: $39.95

Breakers get their pleasure from breaking people—physically.



Breakers is a science fiction text adventure in which you assume the identity of an unfortunate soul trapped in the futuristic space colony on the planet Borg. You'll find yourself torn—sometimes mentally, other times physically—between space smugglers and the mutant police force. Your job is to liberate the planet.

The planet's conflict centers around an ancient and gentle race, the Lau people, who once enjoyed Borg. Before they were conquered by the Breakers, the planet was green and peaceful. But now the planet is policed by cruel misfits who are only slightly better than the Breakers they are supposed to control.

Breakers are a cult of uncaring, unfeeling, unruly, unthinking people who get their pleasure from breaking people—physically. But the Lau have hope. They eagerly search the sky for a saviour mentioned in ancient prophecies. You could be that saviour.

Like all good text adventures, *Breakers* gives you the power to twist the tale your way—what happens, where and when are all determined by what you make the main characters say and do. But this text adventure has a plus. In addition to being a well written story, it is a nonstop action story, too. What this means to you is that you must not only think and type your way through the story, but you must think and type in real-time.

Unlike many text adventures which go dormant after each input, *Breakers'* action continues regardless of whether you respond to its prompts. This means you must read quickly and respond quickly, since timing is critically important both when seizing opportunities and avoiding pitfalls. The program is so impressively structured that it can respond simultaneously while you are typing to the screen. This gives the illusion that the program is listening to your conversation while continuing its own.

If you are familiar with other story games, like *Essex* or *Mindwheel*, you'll feel right at home with this offering from Broderbund. Like those, *Breakers* is a text-only thinking game containing no graphics. Instead, the visions you see here are those generated by your own mind.

If you've never experienced a text adventure, you'll like the easily mastered conversational controls *Breakers* uses. You issue commands just as you would if you were typing commands to another human. To make issuing dialogue easier, you can simplify the lines by eliminating capital letters, commas and the closing quotation mark. Good typists may not appreciate the advantages these shortcuts offer, but I'm thankful for the countless keystrokes the abbreviated option saves.

Like most text adventures, you can simplify most directional commands by simply typing the first letter of the direction you want the character to go (N = North). But *Breakers'* sophisticated parser understands much more than a few dozen cryptic commands. Broderbund claims the program can understand and handle 1,500 words. I'll take their word on that.

But the important question is whether the program understands your command patterns. In most cases the answer is yes, as long as your input relates to the storyline. *Breakers* will respond logically. But if you change the subject (ask about the '86 World Series), *Breakers* will think something is wrong with you.

Commands can also be compounded, so if you want the character to pick up something and do something with it, you can do it with a single command line (Show bloodrock to Betty), which is not only natural, but also saves time. This means you are free to respond to any prompt any way you wish and expect a logical followup. The exceptions to this rule surface when you use the proper nouns or mispell a word (my old English teacher would have loved the program's linguistic stubbornness).

For those who want to physically record their adventures on Borg, there is an option to have all the information sent to the printer as well as to the screen. And as you would expect, you can save your point of play at any time so you can go back and continue from that point later. All the commands and examples are included in the game manual along with a quick reference card. The reference card also lists some special keys (not mentioned in the manual) which make life on Borg easier. For instance, pressing the F1 key will automatically repeat the last input you typed. This can save a lot of typing if you just need to change a mispelled word or a character's name.

Because the dialogue here is well written, the descriptive text resembles that from a good novel instead of the dialogue from more primitive text/maze games. To support the storyline and entertain the reader in the fashion serious readers demand, the text is both lengthy and explicit. This luxury has a cost—each response requires the program to update its memory from the program disk. This constant disk accessing while conversing with Breakers slows the action a bit while the disk drive spins, but the quality of the prose and the intelligent interaction between reader and program makes

Continued on pg. 56

Continued from pg. 54

You spend most of your time on Borg running or crawling from the most unsavory, cruelest, filthiest collection of excuses for intelligent life form anyone could ever have the unfortunate experience to run across.

these delays bearable. Dialogue here goes far beyond simply presenting information, misinformation and clues which culminate in success or failure.

Action continues until you either free the Lau people and destroy the Breakers or die. Fulfilling this prophecy is not for the weak of spirit or stomach. You spend most of your time on Borg running or crawling from the most unsavory, cruelest, filthiest collection of excuses for intelligent life form anyone could ever have the unfortunate experience to run across.

Borg is not a planet to explore with your Brownie troop. Instead, *Breakers* is targeted for the teen and older audience. If it were a movie, it would be rated PG-13. While it is both intriguing, challenging and well written, *Breakers* is more suspenseful than entertaining. Let me clarify that: If you are entertained by a Hitchcock thriller or futuristic science fiction heart stopper, you'll like *Breakers*. But before you settle down with this novel, be aware that the contents here are of a mature nature and packed with nose-breaking action.

Breakers comes with a 73-page manual which includes examples of transcripts, lists of acceptable phrases and verbs, as well as six chapters of text which set the stage for your adventures in the space colony. Since the two program disks (double-sided) are copyable, the manual also serves as a gentle form of copy protection. Each time you boot the program, you will be asked to find and input a randomly picked word printed somewhere in the manual. The program will refuse to continue until you enter the required password. This avoids the frustration of having to cope with a program disk failure after spending hours trying to unravel *Breakers*' mysteries. ■

Tips

Here are a few suggestions for those of you on your first trip to Borg.

1. As always, keep a detailed map showing the areas of the planet you have explored. Without a map, your chances of surviving Borg are about as good as an ice cube in a sauna. And always save your spot in the novel before attempting anything risky. This way if the move results in your death, or worse (on Borg there are fates worse than death), you can simply retrace your steps up to the point of your mistake and try something different.
2. Be sure to find out about Casey Jones as quickly as possible and when you find any of the vital stones (Fire, Fear, Water) be sure to hold on to them. They are all there, just keep looking.
3. Ask lots of questions. The characters you meet can often provide clues you could never uncover on your own. But be sure the people you approach are friendly (never approach a Breaker). And as is often wise in real life, don't offer more information about yourself and your finances than is necessary. The people on the planet are not above taking advantage of a fellow down on his luck or off guard.
4. Don't close your mind to the possibilities. In text adventures, sometimes the illogical is logical. If all else fails, try something weird. For instance (and this is straight from the adventure), at one point in the novel you may find yourself trapped in a hospital. Hide until someone rolls a dead body in the room and places it in a coffin. Wait until you are alone and switch places with the corpse (pretty heavy stuff, huh?). Just be sure to make your exit from the coffin before . . . well, you know.
5. Have fun. There's a lot to experience (perhaps survive would be a more appropriate word) while exploring Borg. Because the text is well written and descriptive, it would be a shame to zip through it too quickly. ■

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DEALER INQUIRIES INVITED

REVIEWED BY MARK COTONE

Commando

Computer: Commodore 64
Publisher: Data East
470 Needles Drive
San Jose, Ca 95112
Medium: Disk
Price: $24.99


JIM OWENS

For you dauntless arcade warriors with just enough Stallone and Schwarzenegger exposure to turn your blood camouflage green, Commando *is all in a day's work.*

Somewhere in the distance lies an enemy stronghold; a well guarded base that must be located, infiltrated and destroyed. That is the objective of *Commando,* Data East's Commodore version of their popular coin-op hit. The scenario is as straightforward and uncomplicated as they come.

But if the odds of successfully completing this mission were based on troop size, your chances would be somewhere around a thousand to one. For in this confrontation, it's a solitary you who must sneak across miles of hostile soil. They are an impenitent enemy unlike any you have seen before, a tenacious force that will not rest until you have been terminated.

Needless to say, the outlook isn't good. And there are even some who would go so far as to call this a suicide mission. But for you, a dauntless arcade warrior with just enough Stallone and Schwarzenegger exposure to turn your blood camouflage green, it's all in a day's work.

If you've ever wondered what was meant by the term fast-paced, let *Commando* be your reference. The relentless tempo offered here will quickly push deliberate, calculated strategy onto the back burner, forcing split-second improvisation and lightning reflexes to become the requisites for victory.

The non-stop action scrolls from top to bottom, continuously revealing different segments of a battle-scarred playfield that is filled with obstacles of every design. Your on-screen soldier is directed by a combination of joystick and keyboard. The joystick controls his movement, allowing him to run and aim in any of eight directions, with a tap of the fire button expelling a slug from an endless machine gun clip. And the spacebar is used to loft your hand grenades, which you are given an initial allotment of three. As expected, their blast is more powerful and their destruction radius a lot wider. Additional grenades can only be obtained by overthrowing and looting the supply stored at an enemy outpost.

The contest is divided into three stages, with each section presenting its own style of terrain and attackers. In the first phase, the land is littered with boulders, trees, sandbags and other assorted forms of war debris, elements that can act as both hindrances and cover. The opposing forces are the basic infantry type, a mirror image of your man except for the color of their rebel uniforms. They will jump, dodge and chase in an effort to cut your crusade short, using either gun, grenade or their superior strength (the enemy will always win in hand to hand combat). Your only advantage is your speed. Being a couple of steps faster than your pursuers, running away becomes a viable, and often advisable, strategy.

Live long enough to enter the second area, and a new variety of perils awaits. Rebel soldiers ambush from caves and foxholes, enemy vehicles accelerate to ramming speed, and massive heavily protected gun turrets spit out a steady stream of deadly salvos.

A more potent breed of adversary is also introduced in this phase: a quick acting foe toting what appears to be some sort of compact bazooka. They move, shoot and zero in on your commando quicker, making them harder to assault and circumvent. But take the time to devise some sort of defense against these super soldiers, for their guest appearance in round two is followed by an all out barrage in phase three. It seems as if every step in this final run uncovers a new pair of these assailants, a threat only compounded by some extremely difficult terrain. Players must zig-zag across an open airfield etched with a maze of rivers and bridges, finally ending the trek at the heavily armed enemy fortress.

The *Commando* challenge brings the sights and sounds of the arcade experience home with faithful accuracy. The screen is alive with color and motion, with a quick pulsing audio track pressing your protagonist across well defined areas abuzz with enemy fire. The animation is fluid, visuals crisp and controller response exacting. Thankfully, all simulated deaths are relatively non-violent, with victims merely fading away without any graphic trace. Prove your military prowess, and a vanity board lets you post your accomplishments.

Occasionally when the playfield becomes exceptionally busy with dozens of soldiers simultaneously converging on you, there are a few instances where some on-screen flickering becomes evident. This might cause some to furrow their brow, but this slight visual imperfection does not affect play.

The only feature I missed in *Commando* was a pause option. From the opening shot, this game takes on a break-neck pace which is only momentarily slowed during the transition

periods between rounds. No matter how quick your reflexes or how sound your strategy, there will come a time when battle fatigue will ultimately leave your trigger finger limp and your soldier defenseless. Even though it is true that a pause option is not found on *Commando*'s coin-op counterpart, I think allowances should be made for those in the home audience whose arcade muscles are out of shape.

How much you will enjoy this contest depends largely upon your gaming preference. If you like war games that unfold like chess matches with meticulous planning and historical realism, then perhaps you should pick a different fight. *Commando* will run right over you. But if you like them fast and furious, where the heat of battle quickly reaches the boiling point, and survival depends on a shoot- now-ask-questions-later strategy, then get ready. A formidable enemy is at hand. ◼

War's Help

Commando's quick pace of play makes instinct and reflexes key tools for success. But that doesn't mean that you can't use a trick or two to gain the winning edge. Below, I've listed a few tips that might assist you in quieting the sounds of battle.

1. At the end of the first and second phases of play are two iron gates: portals which must be passed through to reach the next level. Initially locked shut, these massive hinged doors burst open when approached, releasing a couple dozen bloodthirsty enemy soldiers. Surviving this onslaught is a matter of positioning. When the gates swing back, they can be used as a defense. Instead of standing directly in front of the enemy, waiting for the inevitable killer bullet, stand off to the side, using the open door as your shield from the rebel forces. If positioned correctly, the opposing soldiers won't even get a chance to put you in their sights before they are rudely greeted by your machine gun blast.
2. At the end of the third phase stands the rebel fortress, a different style obstacle that can be treated with a plan similar to the one above. When approaching this base, you must first try to loft a grenade into either of the bottom windows, killing the machine gun guard inside. You can then take your familiar door-side position. There are no gates here, but if you stand close to the front wall, you can still surprise the enemy with an undetected machine gun greeting. Just be careful not to press right up against the building or your shots will ricochet harmlessly off the stone wall.

3. In the beginning of the second phase, two enemy vehicles run after you in an attempt to make you part of their hood ornaments. But their very nature has a tendency to give them away. Before they actually emerge from the flanks, their presence is first signaled by the revving of a running engine. When you hear this audio cue, stop. Most of the time, the vehicles will come out prematurely, passing above you and off the screen. You can then continue your forward progress without worrying about traffic.

4. The most potent enemy soldier, the big blue bazooka carriers, cannot track you if you are standing to their side. Run into this position and they will be rendered defenseless. ◼

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With each monster having its own set of strengths and weaknesses, each city having its own shape and flavor, and each scenario requiring a different tactical approach, one had better come prepared with a well devised plan or he will quickly and unmercifully be turned to monster mash.

if he was the one who pieced it together in the first place.

As your surrogate flies, slides or stomps his way into town, the human forces become alerted and all chaos breaks loose. A few isolated citizens scramble for cover, autos swerve widely in evasive maneuvers, and ambulances speed off to assist unseen victims. On the offensive, the pesky humans mount an attack. Tanks, jeeps and infantry crawl down the avenues, flushing you out and aiming to kill with salvos of every size. Armored boats cruise the shores, helicopters hover, and jets take strafing runs at your chest.

As expected, this type of greeting awakens your mean streak and before long you retaliate with pernicious force. Buildings buckle under your weight, cars and bodies disappear under your feet, and any other obstacles are obliterated with whatever super power you possess. There's no denying it, this is a violent game, but not nearly as gruesome as one might imagine. The programmers have wisely chosen to stay away from any visual gore. Aside from collapsing skyscrapers, which actually do crumble to the ground, all other victims and objects simply disappear when overpowered, with their imminent deaths confirmed with an audio signal like a squash or eek.

This is not to imply that *The Movie Monster Game* isn't an engaging visual experience. The animation and graphics are up to Epyx's usual high standards. The monster representations look and move just like their cinematic counterparts. The cities are different, detailed and three dimensional, allowing both forces to duck behind and around structures for protection and surprise attacks. And even the smaller objects—people and vehicles dwarfed by the massive buildings and beasts—are all well-defined with distinguishable features and movement.

The game, like so many arcade matches, is really a question of endurance—a struggle to outlast the thwarting attempts of the humans long enough to complete your chosen objective. The obvious bash-away survival strategy may suggest shallow gameplay, but that's hardly the case. With each monster having its own set of strengths and weaknesses, each city having its own shape and flavor, and each scenario requiring a different tactical approach, one had better come prepared with a well devised plan or he will quickly and unmercifully be turned to monster mash. This contest's surface appeal might be to a younger arcade audience, but don't be lulled into any false confidence. This is one tough challenge.

I doubt that crowds will instantly flock to this contest. Its divergent structure and unfamiliar, singular subject matter suggests otherwise. Yet, in time, it will surely gain popularity. For even while blazing this new trail, not a single shortcut was taken. The game is well thought out, complete and enjoyable, paying homage to a cinematic genre that is familiar to us all.

Even the documentation contains extra pieces on creature biographies, city information and monster movie history. It all stands as evidence to the time, research and devotion invested in *The Movie Monster Game.* ■

On the Town

A City-Wide Guide to Munching and Crunching

The bigger they are, the harder they fall. And when you're backing a group of beasts who rise head and shoulders above city skyscrapers, you will fall hard, and often. But there are a few tricks that will increase your monster's lifespan, many of which are detailed throughout Epyx's instruction manual. For additional help, check the extra tips I've listed below.

1. In *The Movie Monster Game*, the difficulty level of each contest will be dictated by the combination of elements chosen during the option phase. By studying the idiosyncrasies of each beast, the layout of each location, and the requirements of each mission, you can avoid the structuring of a contest that would be arduous, if not impossible, to complete.

For example, in Destroy Landmark, a plot choice that requires one to search city sites, both San Francisco and New York have built-in monster advantages due to the number and proximity of landmarks. Also, in the same scenario one might shy away from using Mr. Meringue or Mechatron as monster selections. Both are adversely affected by water, an element that could come into play in five of the six city representations.

2. To place yourself in a position to gain the most points in the Berserk scenario, carry out your rampage right along the outer limits of the city. This will allow you to continue to crush and destroy right up to the point when your endurance allotment is about to run dry. Then, with your last breath, you can still take a quick step out of town, capping your final score with some generous survival bonus points.

3. Sphectra can destroy a building much quicker by landing atop it than by butting it with his fragile body.

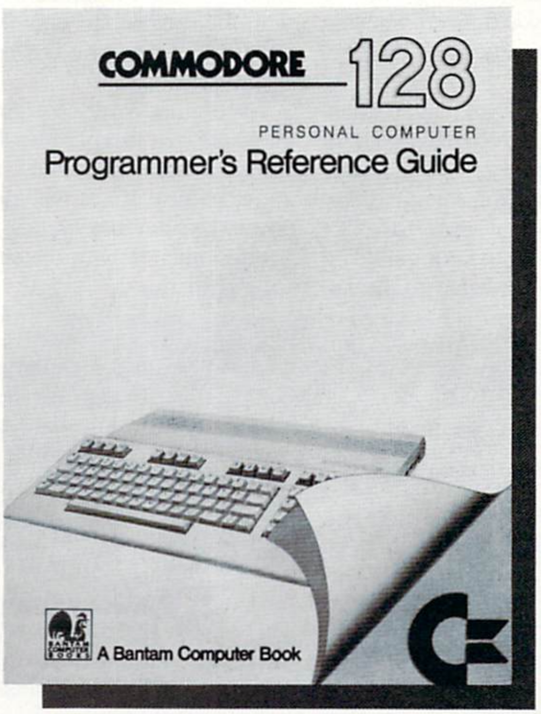
4. When you decide to do lunch at the city's expense, a few things should be kept in mind. First, don't waste time knocking down buildings—this will only sap endurance from your surrogate, without bringing you any closer to your goal. Also, each monster has a different diet and will only have his appetite satiated by specific menu items. Consult the chart below to find out how to satisfy your monster's cravings.

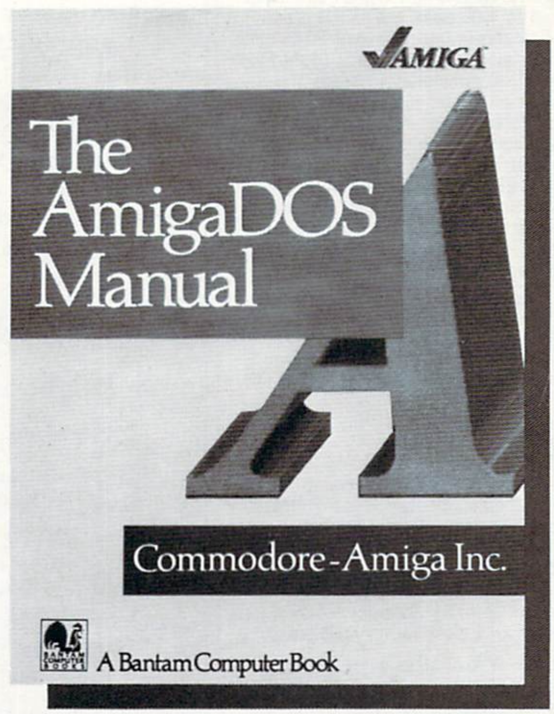
GODZILLA	Green vehicles and ambulances
TARANTUS	People
MECHATRON	Anything in sight
SPHECTRA	Green vehicles
MR. MERINGUE	People, especially the infantry
THE GLOG	Green vehicles

■

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swiftly, with no two missions being exactly alike. Each time the game is approached, the player will be confronted with changing weather, shifting targets and different enemy formations. These variations will force you to stay on your toes, since you never know what you'll come up against. As you're checking your throttle to rectify some engine bogging, an enemy fighter might emerge from cloud cover and strike your port engine, setting it aflame. Then, while you're doing your best to extinguish the blaze before it spreads throughout the craft, the U-Boats you'd been tracking might sense your presence and dive.

It's unpredictable entertainment rounded off with a realistic audio backdrop. The sounds of the engine—droning, revving or sputtering—set the stage while constantly signaling the condition of your craft. Bombs whistle to earth, cannon fire crackles from your guns, and skillful shooting is awarded with the satisfying sounds of a direct hit. And even if you're on the receiving end of a volley of bullets, there's still some enjoyment in listening to your own craft's high pitched scream to extinction.

Potential pilots beware: *Ace of Aces* is a tough flight. It will take time and practice before you come close to completing your first full length assignment. But when you're not up to competing with the sky kings, Accolade has supplied a few shorter trial runs to help build confidence and strength. Each centers on an individual target of the overall mission, allowing you to familiarize themselves with the specific facets of flying without being intimidated by the complexity of the task.

It's you and your Mosquito against legions of Nazis in a perilous flight that will test your nerve as well as your skill. But above all else, it is a well designed, high speed joyride that blends a top notch flight simulator with an engrossing historic scenario. ◼

Air Support

Dogfighting Tips for an Ace in the Hole

In this mission, half the battle is getting there. Players will find little difficulty in developing the touch and timing necessary for destroying their four main targets. But what will remain a constant problem is the tenacious harassment you receive from the German ME-109 fighter planes. The instruction book supplies lots of notes and tips to push you along. Read them over—they will help. In addition, I've listed a few pointers of my own.

1. Even though you are able to fire at an enemy craft as soon as it is sighted, the opposition will always wait until it moves considerably closer before sending off its first volley. You can take advantage of this early edge by quickly dropping your landing gear whenever a Nazi aircraft is spotted. This will cause your Mosquito to slow down, increasing the initial period in which you can attack uncontested.

2. Whenever you encounter an enemy aircraft, your plane's progress towards its target site will be temporarily interrupted. That means that your ship will remain stationary on the Navigator's chart, even if the air battle would have had you zigzagging way off course. But as soon as the opposition is downed, the Mosquito will start moving in whatever direction you end up facing. Be sure to quickly readjust your heading or you will be wasting limited fuel and precious time.

3. The speed of your Mosquito will be greatly affected by the amount of weight you are carrying on-board. Any excess cargo that can be disposed of will make the plane that much faster. So when you have completed your final pass over a ground target, be sure to release all the remaining bombs that might be stored in your ammunition hold. It might only make your Mosquito a little bit faster, but with a swarm of ME-109's on your back, it could be the difference between life and death.

4. Destroying any aerial target with a rocket, as opposed to cannon fire, will double your score for the hit. Unfortunately, the rocket is the slower of the two weapons, making it harder to keep the bobbing and weaving enemy aircraft in your sights long enough to meet the missile. You will probably have more success releasing the rocket a little earlier—a couple of seconds before the target is lined up in your sights. Then, when the rocket is en route, swing the crosshairs across the craft, timing the arrival to score a high value hit. ◼

Continued from pg. 32

Completing a task sometimes helps you move to a new screen that couldn't otherwise be reached. Trying to get from screen to screen can be very frustrating and requires considerable trial and error. But it's a big thrill when you discover a secret passage or trick that will help you move to another screen.

Many of the screens will contain patrolling guards and at first you'll be tempted to duel with them. But you'll soon grow bored with the swordfights, since you don't have much control over Zorro's swordplay. About all you can do is move him forward or backward while the computer handles the actual dueling. Your control is limited to either pushing your foe off a ledge or skewering him by pressing your joystick fire button when his guard is down.

It's very easy to get so preoccupied battling guards, exploring screens and accomplishing tasks that you forget your real purpose—rescuing the senorita. But in the end, all of the actions you take will help you complete that mission. And if it ultimately proves too difficult, you can still enjoy the game by concentrating on accumulating points instead of rescuing the senorita.

Any way you approach it, the game's excellent graphics help make it a pleasure to play. Characters move smoothly through scenes that feature Spanish-looking buildings which give the feel of old California. A particularly nice touch is the way Zorro's trademark appears whenever he wins a duel. Instead of falling to the ground, his opponent turns into a Z and then disappears.

Little touches like that help lift *Zorro* a notch above many other role-playing games. Datasoft has combined many different elements of gameplay into one intriguing package that, like the character it's based upon, may very well leave its mark on you. ▣

Tips for Playing Zorro or How to Stick It to Garcia

The two biggest problems you'll face as Zorro are figuring out how to get from one screen to another and what special tasks you're supposed to accomplish.

In order to move from one screen to another, you simply move Zorro left, right, up or down until he leaves the screen you're on. The next screen then appears. That sounds simple enough, but keep in mind that each screen may contain as many as six different exits on any number of levels or floors. Before you even begin to worry about rescuing the senorita or accomplishing other tasks, try to explore as many screens as possible.

While you're trying to do that, remember that if Zorro exits from one floor, the next screen may be different than it would be if he exited from a different floor. Also keep in mind that there will be times when you will be unable to return to the previous screen through the same door you used to enter the screen you're on.

What all of this means is that it's very important to keep a map of your progress. You have to keep track of which exit got you to a particular screen and how to get back to the one you just left. This becomes even more crucial when you consider that it's sometimes impossible to get from one floor to another without first exiting a screen and then re-entering it at another level.

Remember that not every exit will be clearly marked, and even those that are easy to spot may not be easy to reach. Be prepared to climb, jump, crawl, leap, vault and bounce in order to reach a certain point or exit on a screen.

And don't forget to use your brain, just as Zorro would. Everything is not always as it seems. Who knows what you may find that will help you clear a particular hurdle or reach a seemingly unreachable exit.

Don't be afraid to pick up items you stumble upon during your explorations. You may even need to transport some items from one screen to another to complete tasks that will help you in your quest.

As for the tasks themselves, rest assured they won't always be obvious. Try doing different things with different items, and feel free to drop one item to recover another. Zorro can only carry one item at a time, so make sure you pick a convenient place where he can stash the ones he won't be using for a while, but may need later.

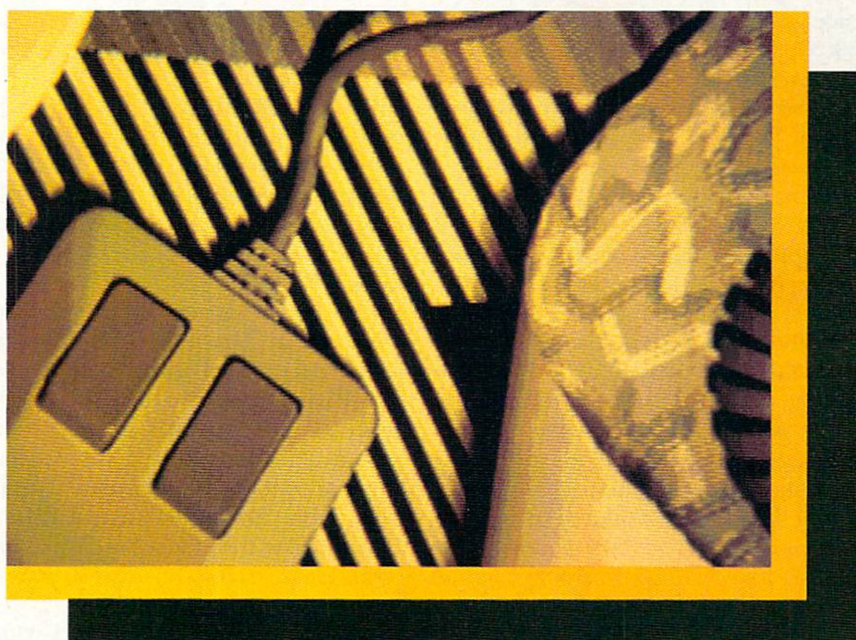
If it sounds as though there's a lot to think about while playing *Zorro*, you get the idea. This is one adventure in which Zorro will have to use his wits more than his sword. ▣

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500XJ Joystick

Computer: Commodore 64/128, VIC 20, Amiga
Manufacturer: Epyx
600 Galveston Drive
Redwood City, CA
94063
Price: Not available for publication

We asked our toughest critics, some of Commodore Magazine's *top-notch reviewers, to take a look at Epyx's new ergonomic joystick. Here's what they had to say.*

Mark Cotone:

Using an assortment of punishing arcade games as a proving ground, I put the 500XJ through the mill, exposing it to rigorous tugging and tapping that would have wreaked havoc on a weaker controller. The solid steel shaft, blanketed in an unbreakable hard plastic shell, survived its transformation into steering wheel, rudder and yolk without a hint of bending, snapping or chipping. The fire button paced the strut of athletes and the sting of artillery without a single misfire. And the joystick base that fits in your hand like it's supposed to be there, felt secure and comfortable even when sweat greased the grip. In the end, my arm went limp long before the 500XJ even showed the slightest sign of wear.

One look at this product can attest to the uniqueness of its physical design, but only by actually using the 500XJ can one appreciate the value of its most outstanding feature: the tactile-response microswitches. Any time the shaft is moved or the fire button depressed, there is a confirming "click" that can be felt as well as heard. There will never be a doubt whether any player input is registered. And these switches are so precise and responsive that only the slightest pressure is required to register the desired onscreen action. Joystick-induced palm callouses and finger blisters may become injuries of the past.

The only problem I foresee with the 500XJ is for left-handed players—players who usually place the controller in their right hand. For this group, the structure of the joystick will make it uncomfortable and ineffective.



Scott A. May:

The 500XJ is a solid performer that won't cramp your style or your hand. It is tough enough for the most grueling arcade challenges, offering smooth response and quick fire power. With greater control and less fatigue, I found myself playing longer and scoring higher. At last, a joystick that almost gives players an unfair advantage.

Its sensitivity is also perfect for more delicate applications, when precise control and finesse really matter. In overall design and performance, the 500XJ is the designer joystick we've been waiting for.

Gary V. Fields:

First Epyx changed the exterior look of the stick. Then they changed the inside. The solid steel central shaft, encased in a stubby red plastic stick, works against five heavy duty microswitches. The combinations allow you to feel and hear the control—not just see the results on-screen. The short stick responds more quickly than longer sticks because it doesn't have to travel as far to activate the switches.

The stick is so sturdy it comes with a five-year warranty. It is built to survive punishment and to respond quickly, but may disappoint two groups of users: left-handers and people with small hands. While I found the joystick fit comfortably in my fullgrown male hand, my pre-teen children refused to use it because they couldn't wrap their smaller hands around the controls.

Bob Guerra:

The 500XJ provided fairly precise control, especially when moving horizontally or vertically. Thus, it was fine for most arcade games and flight/aerial combat simulators. Smooth transitions to diagonal movement aren't easily made, however, and this posed a small problem with games requiring smooth movement in all directions, such as *Marble Madness*. I also found that moves that require you to move the stick on a diagonal were difficult, such as in Epyx's *World Karate Championship*.

Because of the lightness of the 500XJ, the short throw of the stick and the index finger-operated fire button, it is one of the easiest sticks to use for long periods without getting a sore hand. While Epyx describes the "clicking" you hear (as the stick's directional switches are thrown) as something like positive audio feedback, I found it, while maybe not annoying, to be somewhat unnecessary. Seeing on-screen objects immediately move in the direction I select is usually reassuring enough.

John Jermaine:

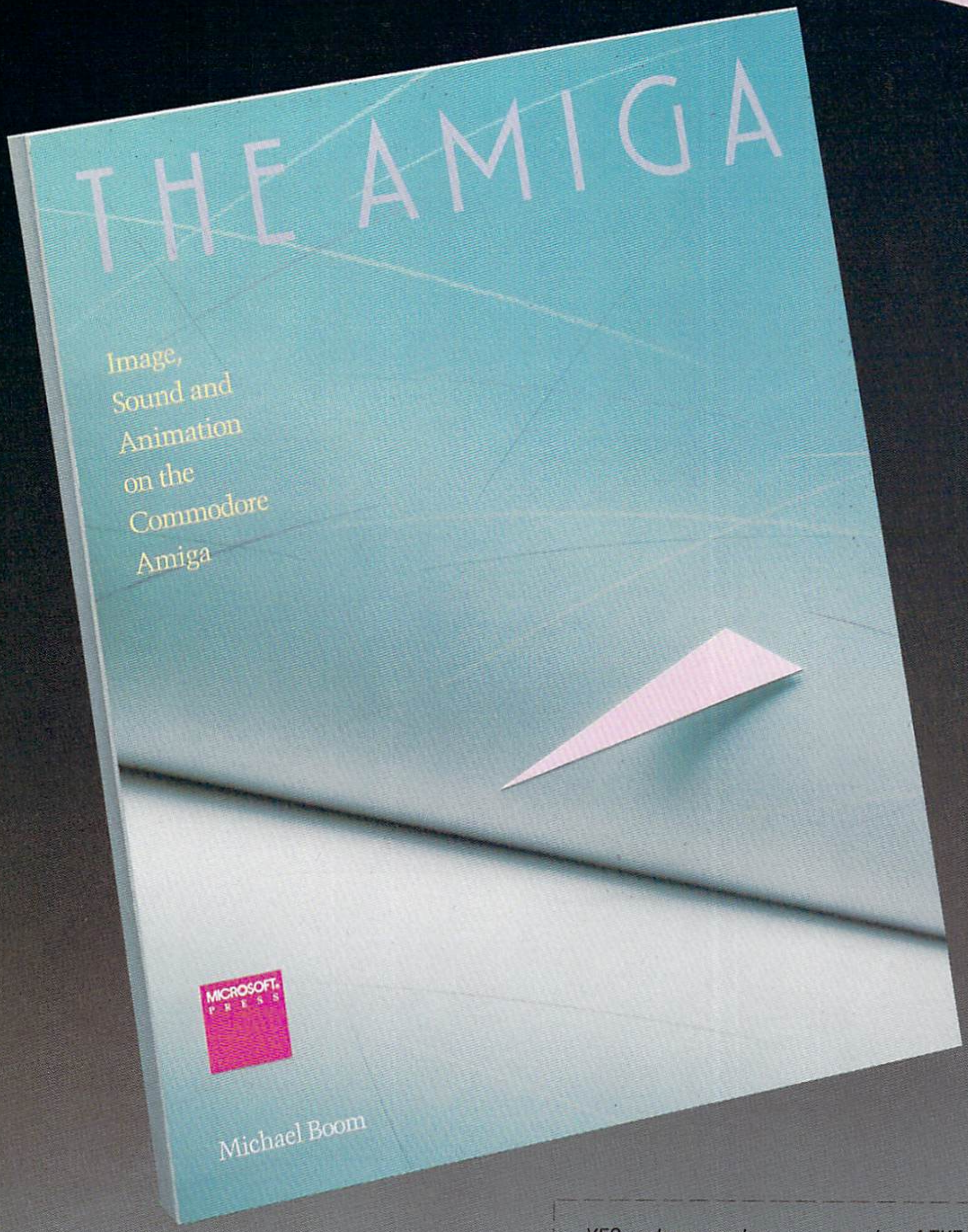
Under combat conditions, the unit gets an excellent rating. I began my testing by loading in Atarisoft's *Donkey Kong, Dig Dug* and *Ms. Pacman.* These games are traditional crowd pleasers, with some joysticks having difficulty manipulating the main characters on the screen. The Epyx stick, however, performs like a champ. Recent releases like *Marble Madness, 10th Frame, Super Cycle* and *Ace of Aces* can be played equally well with the new joystick.

A final challenge for an excellent stick, oddly enough, came from Epyx. I loaded in my copy of the original *Summer Games* program and tried to beat my best scores in each event. Out of eight events, the 500XJ joystick allowed me to beat my best times or scores in six of them. I entered each event twice for this test, because I hadn't played the game for a while. Considering how many times I've played *Summer Games* with other controllers, this is the best single testimonial I can give.

I continued testing the 500XJ joystick with 43 other programs, both old and new. In the case of action games, my scores improved during the playing of 22 out of 39 games. When it was used in conjunction with other forms of programming, the stick performed well or equally well when compared to its competition. I believe that the Epyx unit is somewhat more sensitive than most other joysticks, and I'm currently using it for all of my game evaluations.

Continued on pg. 125

Fire Your Imagination!



Are you a graphic artist? An audio/video specialist? A computer enthusiast? Just as the Commodore Amiga dazzled the computer world, THE AMIGA — this sizzling new book from Microsoft Press — will spur your imagination to new horizons of creativity. If you have some BASIC programming experience, get ready to produce amazing results with your 512K Amiga that go far beyond the beginner's level.

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THE AMIGA by Michael Boom. Your guide to mining the rich artistic depths of this fantastic machine. $19.95

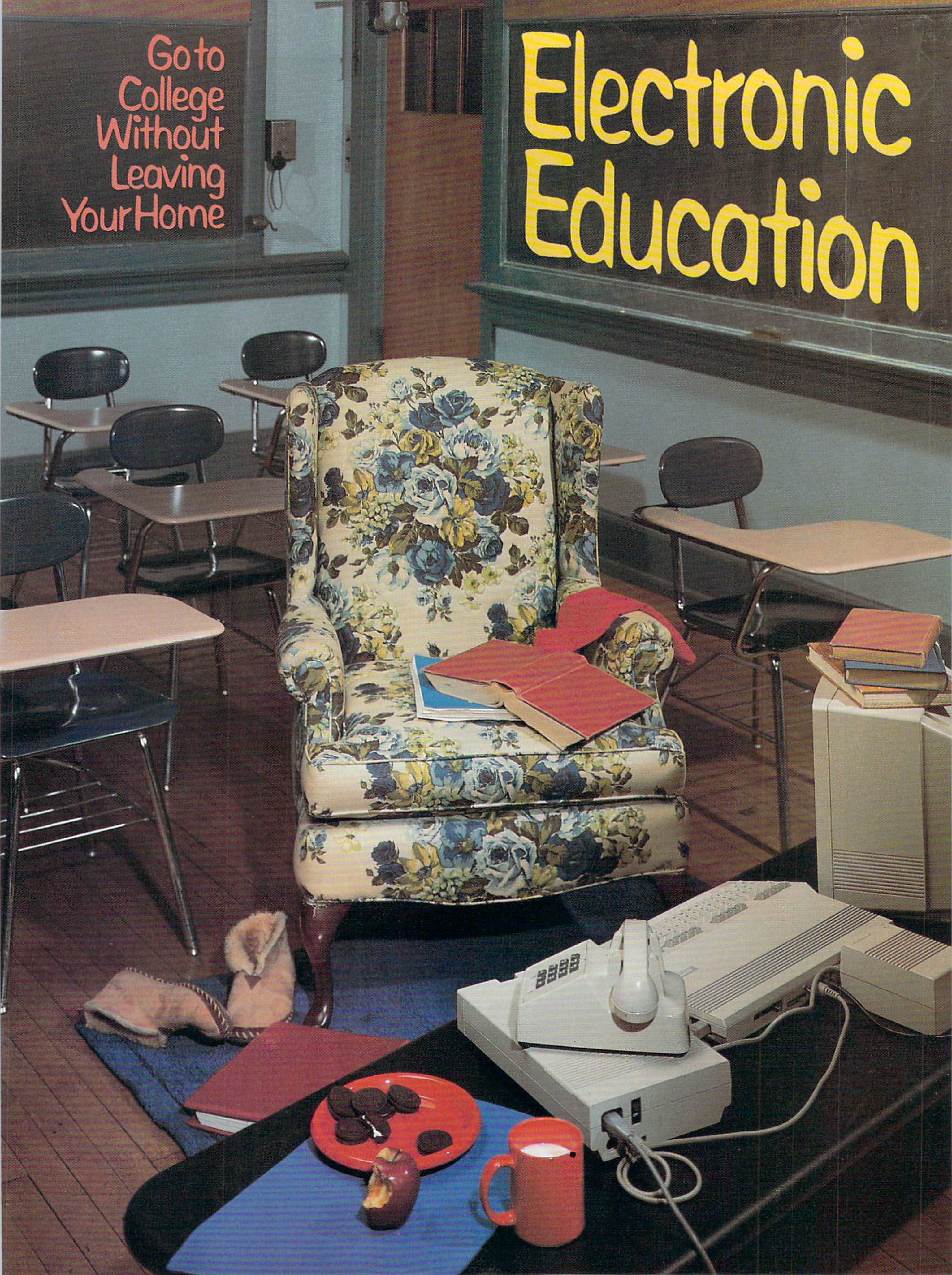
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Go to College Without Leaving Your Home
Electronic Education

BY GARY V. FIELDS

According to the U.S. Department of Education, 40 million Americans began, but for one reason or another, never earned their college degree. Now there is a viable alternative to attending classes on campus. Thanks to your Commodore computer, you can begin, finish, or, if you prefer, sample college without leaving your chair. All you need is your computer, a modem and the desire to learn.

My dilemma began with a promotion which meant more than just added responsibility. The new position required a familiarity with data processing techniques beyond my knowledge. The obvious solution was to go back to school for a data processing course, but my work schedule and the time of the community college's data processing class clashed. Fearful of losing to the famous Catch 22, I started looking into educational alternatives.

Surprisingly, I found two alternatives to regular on-campus classes in only one day of searching. The first alternative is the Electronic University Network, and the other is MicroNet, a service offered by Western Carolina University. Both are computer-linked networks (not simply electronic versions of mail-order classes) which allow you to take college-level courses at home.

The Electronic University Network caters to the whole nation, while MicroNet is primarily targeted for students in North Carolina. While you may have no need for MicroNet's services because of your location, similar networks may be operating near you now or will be in the near future.

I'll take you on a short tour of both systems, tell you how they work, how they compare, how much they cost, and why they may be your frustration-free ticket back to school.

The Electronic University

The first fact you should know is that the Electronic University is not a university at all (it does not grant course credits directly). Instead, it is an electronic delivery service for several universities and colleges. The institutions which make use of its services include quality schools like Pennsylvania State University, University of Iowa, and Washington State University, to name a few.

Two schools, John F. Kennedy University and Thomas A. Edison State College, even offer enough on-line classes for a degree. The other colleges and universities offer specific classes which you can use in combination with traditional on-campus classes to earn a four-year degree. This is perfect for students who already have some college credits, since they may be able to finish their education by taking classes offered by the Electronic University and then transfer the credits to the campus where they began.

Studies show that most of the network's students are between the ages of 30 and 40, work, have a family, and have one to two years of college already under their belt. Those students are more interested in finishing their studies than starting over. They are looking for on-line classes which can be transferred to the school where they began. The transfer of credits earned through an on-line school is done exactly as it would be between any two institutions. The network simply serves as a link between the two.

The great advantages of taking classes on-line instead of on campus are convenience and timing. On-line classes meet when it is convenient for you and the location of the classes are never a hassle since they are held in your own home. This flexibility was important in my case since my waking hours are divided between my regular job and home activities. With two young children, the only time it gets quiet enough for me to study is late at night after they are in bed. That's when it's time for my data processing class. When most sensible college professors are comfortably under the covers is when I retreat to my office, flip on my system, install the course disk and settle into class.

Cost

After I registered with the Electronic University by phone, I received a package in the mail containing the program disks, a student handbook and a course catalog. I needed a textbook too, which I bought directly from

CHUCK BARTHOLOMEW

Studies show that most of the Electronic University's students are between the ages of 30 and 40, work, have a family, and have one to two years of college under their belt.

the Electronic University. I could have purchased it locally, but the cost was the same so I opted for the convenience of having the postman deliver it.

Regardless of where you buy a textbook for college, they are not cheap—expect to lay out $30 to $50 for each. The class itself set me back just over $200 (most cost between $100 and $400). No one ever said higher education was cheap. And because this was my first Electronic University class, I had to pay another $195 for my lifetime enrollment. However, the fee covers not only me, but my entire family, and is good as long as I live.

I found these extra expenses easier to justify when compared with tuition cost for regular classes and the savings of the cost for transportation, food and expense of living in a dorm. When all those costs are compared, the convenience of selecting the time of the class and being able to take it from my home makes the on-line class a much more attractive alternative.

Along with the course disks, I got a terminal program called Resource which lets me use the Electronic University's library data base for research. In my case, because the city library is so convenient to my work, I'd rather use it. But I can understand how students who either live a long distance from a library or who, because of time or physical restrictions, can't use a traditional research source, would appreciate the convenience of using the network's library data base.

My first day back to school had few parallels with those I experienced when I was earning my degree back in the late '60s. Attending college via computer spared me many of the annoyances of campus classes. First, I didn't have to roll out of bed and scrape frost off my car's windshield to register for class. I registered with a single toll-free phone call. I didn't have to elbow my way through the campus bookstore to get the last copy of the course's textbook either. It was shipped directly by the network. I didn't have to endure the campus cafeteria, parking restrictions or the stodgy Dean of Men, either.

Hitting the Books

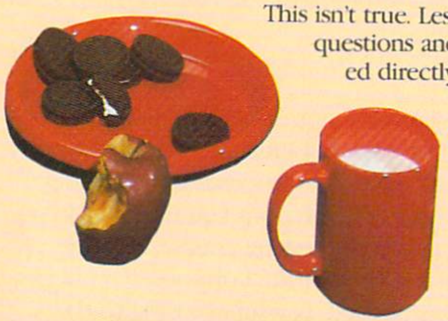
I found the class software both logically structured and easy to use. If I have any questions about using the software, help is available via help screens. When I need help that is not covered in the student's handbook or in these help screens, a toll-free call puts me in immediate contact with either a course or software/hardware counselor.

After the title screen clears, the main menu appears listing the various divisions of the course: Work On Lesson, Send Lesson, Receive Instructor's Message, Read Instructor's Message, Print Messages or Lessons, Delete Messages or Lessons, and Change Communication Information. At this writing, the Electronic University's software supports only their own inexpensive 300-baud modem, but shortly it will support most popular modems, including rates up to 1200 baud.

The items on the menu are highlighted by cursoring up or down and are selected by pressing RETURN. Because the course itself is stored on the program disk, I was free to experiment and explore the features without fear of either breaking the system or offending my professor.



Thankfully, nothing I do in class is reported to my instructor until I'm ready for him or her to see it. I erroneously assumed all the time in class would be on-line, meaning mistakes I made would be captured by the main computer where it could be reviewed by my professor. This isn't true. Lessons, messages, questions and essays are all stored directly to disk and are not transmitted to the Electronic University until I'm sure they are what I want my professor to read. This means that if I should nod off during class or misspell Industrial Psychology, no one need know.



To pass, you must not only be a good student, but be self-motivated. No on-line teacher is going to complain if you don't show up for class. No letter will be sent to your parents if your grades slip.

At the beginning of each class, I always check with the network for messages from my professor. These messages let me get to know my professor, receive personalized tutoring, and collect my homework assignments. Up to that point I was enjoying going back to school, but alas—even electronic schools insist upon homework.

During the first class, my professor told me a little about himself, described the class, told me what he expected from me, gave me advice on preparing lessons, and told me what I could expect to accomplish in his class. Next I had to tell the professor about myself and why I was taking the class. If that sounds like day one in any freshman class on any university across the country, that's because the difference between electronic and traditional classes differ only in the way they are presented, not in substance.

The Work On Lesson option presents the course work. Information is presented conversationally. The professor discusses a topic, refers to pages in the text, and asks questions. I respond by typing to the screen. My answers are stored on disk until I'm satisfied they are ready for grading.

The lesson section of the course is different than most campus classes. First, I have to read—not listen. I've heard horror

Greg Capps

Computer Enthusiast Extraordinaire

At Western Carolina University, located in the shadow of the Great Smokey Mountains, Greg Capps is just another student. He worked hard to earn his first degree and now, at age 24, is closing in on a Masters Degree in Clinical Psychology. In his dorm are two computers. Again, nothing unusual.

Capps says he could never have gotten this far in his studies if he hadn't had the help of a computer. "Computers are a necessity," says Capps. "One of my early classes at Chapel Hill required I sort through the register of the campus enrollment. Without a computer to crunch those numbers, I would have never finished the report."

Daily he lets his computers minimize the demands of earning a degree by helping with word processing, data management and collecting information via telecommunication.

The only thing that makes Capps different is the fact that he can't read the manuals which tell him how to operate his computers. He rarely glances at his computer's monitor, and he's never won an arcade game. All because Capps is blind.

Capps has found ways to minimize his liability. For him, a computer is the great equalizer. When he's on-line with other MicroNet users, he's just another account name. When the subject of computers comes up, he's just another enthusiast. In class, he's just another good student. That's the way he wants it and today's technology helps make it possible.

Obviously, not being able to see the monitor display would present a tremendous handicap for most of us. Capps solved the problem with software which synthesizes speech. One program he uses echos every word printed to the screen so he can hear it, and works with any program as long as it is written using straight ASCII code. As a result, Greg is a great fan of public domain software since much of it is written in BASIC. He also uses a speaking word processor, database and terminal program as well as a spreadsheet.

Like most computer users, he longs for better programs with expanded features and, hopefully, at more affordable prices. One of his greatest desires is for a braille printer. But the one he wants retails for $5,000—beyond the finances of most college students. Without it he must transcribe all his work using a manual braille typewriter.

Perhaps Greg's greatest learning aid is his own unfaltering memory. Because he cannot see to read, he hires other students to read his computer manuals into a cassette recorder so he can listen to them. His memory is doubly important when he's using his computer. Since the speech synthesizer speaks each word only once as it is written on the screen, Greg must remember all he hears.

Dorrie Kennedy, Director of Educational Development for the Electronic University, has come to hear many of these amazing stories about handicapped computer users. Among the thousands of students taking advantage of on-line classes, a good percentage have handicaps which limit their ability to attend regular classes. For them, their computer coupled with the right software has opened doors of opportunities closed for centuries. Properly equipped, these students can not only attend classes at home, but in some cases earn a living there as well. "This is the new age of technology," says Kennedy, "and what matters is peoples' minds."

New products are surfacing which can help sight-impaired students. The introduction of the Amiga computer, with its built-in speech capabilities, is a natural choice of such students. Among the software making its way to this special market is Rosette Software's talking word processor—simply called Talker. For the 64 user, a speech detector called Vic-Talker is being joined by a talking terminal program from Hearsay Software. And Brad Stewart of Covox Inc. (maker of Voice Master speech synthesizer and recognition hardware) is excited about the possibilities their Speech Construction Set will offer programmers working in this field. Properly used, the program could help physically-impaired as well as sight-impaired users communicate with the outside world via their computer.

The development of these unique peripherals and programs, along with the expanded use of telecommunications, has opened the future to all willing to explore. Networks first brought entertainment and business news into your home. Next they opened the doors to the world's merchandise. Now networks are opening the doors of the best institutions of learning to all desiring to learn. Students like Capps, while proving that those willing to seize opportunities will be rewarded, are also proof that we all are only as handicapped as we allow ourselves to be. ■

stories about students who finished high school and even a couple of years of college without ever learning to read. No need to worry about this happening here. Second, instead of being only one student in a large classroom, classes are taught one on one. This means my instructor functions more like a tutor than a traditional teacher. I loved this student/teacher attention.

But more importantly, class papers are not taken up at the end of the class (unless I want it that way). What this means is that after every lesson, I can save my input to disk (instead of uploading it to my professor) and redo it after I've done more studying. This allows me to bone-up on areas I missed when first reading the text.

Aids

What is really nice about on-line lessons is the built-in learning aids available in a keystroke. For instance, a disk-based file card system keeps class notes (eliminating the writers cramp I used to get trying to keep information on regular 3″ x 5″ cards).

There is also an area called Brainstorm, which lets me do just that—take a fact or idea and quickly develop it on-screen before it becomes stale. Another on-line option lets me organize, store or print my thoughts. There is also an area reserved just for writing essays and another for keeping track of questions I want to ask my instructor.

The Change Communication Information listed on the main menu lets me easily change things like the access number and the screen display colors.

Test Time

Final grades are determined by the results of the lessons, on-line testing on essays, and a final exam. The only time I have to leave my home while attending network classes is to take the final exam. The only way to fairly administer the test

Continued on pg. 124


LIBRARY

A Library as Close as Your Computer

BY GEORGE SHELDON

Using your computer, your telephone and a modem, you can access enormous sources of information. These electronic libraries are never closed, and they offer information on virtually any subject—from aardvarks to zithers.

Need to know who the National League batting champ was in 1951? Want to learn more about fuel cells? What is the latest inside scoop in the satellite industry? That information and millions of facts like it are available in electronic data bases, and the only tools you need to access them are your Commodore computer, a telephone, and a modem.

In short, you use your computer and modem to dial up a master computer, and after you have established communication—which really means getting both computers to "talk" to each other—you command the master computer you have called to begin searching for the information you want. The master computer opens up imaginary file drawers, filled with vast amounts of information, and when it finds a page of information you have requested, it displays the information on your computer screen.

Suppose, for instance, that you needed the most updated information on the tobacco industry. Without a computer, you would have to drive to the library and start searching through the massive reference books available. To get the most recent information, you would also search through recent magazines or other periodicals. If your library is a small one, you may have to request the librarian to order the magazine for you through an inter-library loan program. Then you wait a week until the magazine you want is mailed to your library, and when you go back to review the magazine, you find that the information you wanted is not even in the article.

And suppose you find another source of information, the Tobacco Institute, so you jot down their address and write them a letter requesting the information. And you wait for a reply. And wait. And wait.

By using your Commodore computer to search for the information, you can do so from your home at any hour of the day. The information you are retrieving is usually not free, however. You may have to pay for long distance telephone charges, and there is usually an access fee for the actual time you are connected to the information service's computer. So, although the conventional method may be cheaper, it is slower, and probably not as thorough as computer-assisted research.

With less aggravation, the savings of car expenses to travel and park at a library, and the convenience and speed at which you can obtain the information, it may be worth the few extra bucks electronic researching may cost.

Where to Begin

Finding out where to search for information is probably the hardest part of electronic researching. It is like walking into your public library, seeing thousands of books, and trying to find the book that is the most likely to contain the information you need.

For basic researching, several of the commercial information services may be your best place to get started. The CompuServe Information Service, the largest consumer network in the U.S., has a new service called IQuest that links you to over 700 data bases and sources of information.

Many of the information networks offer access to Grolier's Academic American Encyclopedia. This is a good place to get general information about many topics.

NewsNet has hundreds of newsletters on-line, with updated information about very specialized topics. The latest information about metals and mining, government, taxation and financing is available from NewsNet's impressive collection of data.

ILLUSTRATION: JEFF ZINGGELER
COMPUTER GRAPHICS: WAYNE SCHMIDT

If you are going to be doing a lot of on-line researching, there are books available that will help direct you to where to find information. If you will just be occasionally looking for information, you would probably do best by using one of the major information services.

Getting Started

Getting started with electronic researching is easy, after you have your Commodore properly configured with a modem, a telephone and communications software.

Remember, the information is not free. You may have to pay an annual subscription fee, and you will be charged for actual connect time to these services. In addition, if you must call any long distance phone numbers to access a service, these charges will also appear on your monthly telephone bill. However, the large services generally require only a local telephone call on your part. Your are then linked from your local "node" to the main computer, and do not incur long distance telephone charges.

But before you can use your Commodore computer as a research tool, you need a modem. Modems are available in all shapes and sizes. Prices are as low as $35 and can run as high as several hundred dollars.

When buying a modem, the first decision you will have to make is how fast you want it to operate. Most modems have a speed (the rate at which they transfer data) of 300 baud. However, the trend now is toward higher speed, 1200-baud modems. Of course, the higher speed modems usually cost more than the 300-baud models. But the difference in the speed, or the rate at which your computer transfers data, could offer a substantial savings when you are researching.

A 1200-baud modem operates at a speed four times as fast as a 300-baud modem. Most libraries and information sources charge a higher rate for information retrieved at the 1200-baud rate. But remember, even if the price is double at 1200 baud versus at 300 baud, it will take only one-fourth as long to obtain the information. Your costs, including any long distance telephone charges, will be less with the higher speed modem.

Here is a list of some information services available to Commodore users.

Special Note: All of the phone numbers listed here are for the offices of the services. They will not connect you with a computer. These numbers are presented so you can obtain more information about electronic researching.

CompuServe
CompuServe Information Service, Inc.
5000 Arlington Centre Boulevard
P.O. Box 20212
Columbus, OH 43220
(614) 457-0802 (800) 848-8199

Now seven years-old and over a quarter-million subscribers strong, CompuServe is an electronic researcher's dream come true. With the addition of IQuest, a service that permits connections to over 700 data bases, CompuServe can be a great source of information. By joining CompuServe, you save the aggravation of joining each of those 700 individual data bases. While not the most inexpensive, it is certainly not to be overlooked as a comprehensive source of serious information about many subjects.

Price: Basic connect rates for prime time: $12.50 per hour at 300 baud; $15 per hour at 1200 baud. Basic connect rates for non-prime time: $6 per hour at 300 baud; $12.50 per hour at 1200 baud.

Note: Surcharges may be added for using certain data bases or services on CompuServe. Always consult CompuServe's billing information before connecting.

Delphi
General Videotex Corporation
3 Blackstone Street
Cambridge, MA 02139
(617) 491-3393 (800) 544-4005

This is perhaps one of the lesser known, but certainly not to be overlooked, information services. Its commands are so easy to understand and execute, you will not be using the help command much, if at all. Delphi features an encyclopedia and a selection of newsletters, news sources and other research sources. A very good service priced very reasonably.

Price: $17.40 per hour at 300 baud; no additional charge for 1200 baud in prime time. For non-prime time it is $7.20 per hour. There is an initial sign-up fee of $29.95, which includes $20 worth of free on-line time.

Dow Jones News/Retrieval, Inc.
P.O. Box 300
Princeton, NJ 08540
(609) 452-1511 (800) 257-5114

For business/investment researching, Dow Jones News/ Retrieval is a great place to look for information. A superior service brought to you by the same publisher that produces the Wall Street Journal, this service allows you to search through several years worth of old issues of the newspaper, as well as the Dow Jones Newswire.

Price: Prime time rate is 90¢ per minute; 20¢ per minute during non-prime time. These rates are for 300- baud service; rates double for 1200-baud service. Sign-up fee $29.95, includes five free hours.

Note: Surcharges may be added for using certain data bases or services on Dow Jones. Always consult Dow Jones' billing information before connecting.

GEnie
General Electric Information Services
Company
401 North Washington Street
Rockville, MD 20850
(301)340-4000 (800)638-9636 ext. 21

This service is still growing. For researching, its sources are limited, but it does permit access to Grolier's Academic American Encyclopedia. GEnie offers low rates, and for 1200-baud users, there is no additional charge for the faster speed. If you need an encyclopedia often, GEnie may be the best way to access it.

Price: $35 per hour prime time; $5 per hour non-prime time. No additional charge for 1200-baud service. $18 sign-up fee.

InfoMaster
9229 LBJ Freeway, Suite 234
Dallas, TX 75243 (800) 247-1373

From Western Union, InfoMaster offers access to over 700 data bases. Everything from the Sludge Newsletter to Coffeeline is offered here. Certainly an impressive source of information, InfoMaster provides access to many different sources of updated information.

Price: There is a $25 annual fee to maintain a password for using any of InfoMaster's 700-plus data bases. The charges are 15¢ per minute for access from a local number; 35¢ per minute for access through InfoMaster's WATS (800) number, in addition to 20¢ per call. In addition to connect time, a search fee is also charged.

Note: In addition to variable search fees, surcharges are sometimes added for reviewing certain newsletters.

NewsNet, Inc.
945 Haverford Road
Bryn Mawr, PA 19010
(215) 527-8030 (800) 345-1301

Much of the information on NewsNet is not easily available elsewhere because much of it is originally published only in small newsletters. NewsNet has a very strong search-and-find command system. The specific, pointed, updated information can be very useful.

Price: Prime time is $24 per hour at 300 baud and $48 per hour at 1200 baud. Non-prime time is $18 per hour at 300 baud and $36 per hour 1200 baud. There is a $15 monthly subscription fee. Access to some newsletters may carry additional surcharges.

QuantumLink
Quantum Computer Services, Inc.
8620 Westwood Center Drive
Vienna, VA 22180
(703) 448-8700 (800) 392-8200

Just for Commodore 64 and 128 users, QuantumLink has limited research information available. Grolier's Academic American Encyclopedia can be accessed, and some other services, such as USA Today News, may provide limited research information. Certainly an affordable service, QuantumLink is available only from 6 P.M. to 7 A.M. Eastern time.

Price: Base rate is $9.95 per month. "Plus" services are billed at the rate of 6¢ per minute. However, the first hour used each month is free. No extra charge for 1200 baud.

The Source
Source Telecomputing Corporation
1616 Anderson Road
McLean, VA 22102
(703) 821-6666 (800) 336-3366

Certainly one of the best on-line services, The Source is a great source of research information. Owned by Reader's Digest, it offers many special features, including Microsearch, a data base of nearly 100 computer-oriented magazines. Information is available from the Washington Post and United Press International. Another data base, Management Contents, Ltd., holds the last two years of over 100 business magazines, such as Barron's, Business Week, Forbes, Fortune.

Price: Prime time is 36¢ per minute at 300 baud and 43¢ per minute at 1200 baud. Non-prime time is 14¢ per minute at 300 baud and 18¢ per minute at 1200 baud. There is a $49.95 registration fee and a $10 minimum monthly fee.

Note: Tutorial and member information services are free; time spent in SIGs (Special Interest Groups) is discounted.

In addition to these general information service vendors, there are also many individual data bases available for specific kinds of information. This is only a very short list to demonstrate just some of the many sources of information you can find on-line.

American Bar Association. (312) 988-5000. Provides information about case law.

American Institute of Certified Public Accountants. (212) 575-6200. Provides information about accounting, taxation, and related topics.

Chase Econometrics. (215) 667-6000. Provides information about energy.

Computer Sports World. (800) 321-5562. Provides data about the world of sports.

The Foundation Center. (212) 620-4230. Provides information about available grants.

MedComp. (415) 895-2862. Provides information on medicine, health, and related topics.

Books

There are also many books available that will provide more information about electronic researching. Here are just some.

Answers Online, by Barbara Newlin. Osborne McGraw-Hill.

The Complete Handbook of Personal Computer Communications, by Alfred Glossbrenner. St. Martins Press.

The Computer Phone Book Directory of On-Line Systems, by Mike Cane. Plume Books.

The Computer Phone Book Guide to Using Online Systems, by Mike Cane. Plume Books.

The Computer Phone Book Online Guide to Commodore Computers, by Mike Cane. Plume Books.

Dialing for Data, by David Chandler. Random House, Inc.

Fast Facts Online: Search Strategies for Finding Business Information, by Dan Ness, Jr. Dow-Jones-Irwin.

Infomania, by Elizabeth M. Ferrarni. Houghton Mifflin Company.

Inside Information, by John Helliwell. Plume Books.

Hints for Faster Access

Saving time while on-line is the name of the game. Here are some hints to help keep your on-line time to a minimum.

- Use specific "search" words. For example, instead of searching for PRESIDENTS, look for JAMES MADISON.
- Simplify your searches by eliminating common words like the, for, of, in, at, to, by. Instead of asking for information about THE UNIVERSITY OF THE STATE OF NEW YORK, make your entry UNIVERSITY NEW YORK.
- Don't worry about upper- and lower-case letters. For example, MILWAUKEE, milwaukee, or MILwaukee will cause the same search command for information about Milwaukee.
- Learn how to broaden your searches with specific commands. For example, if the searching computer can use the word OR to expand its searching, enter this command: DICTIONARY OR THESAURUS for information about either book.
- Learn how to narrow your searches with specific commands. For example, if the searching computer uses the word AND as a command to narrow a search, enter this command: MARINES AND IWO JIMA for information only about the Marines and Iwo Jima.
- Learn how to eliminate certain areas of searching. For example, if the searching computer uses the word NOT to ignore certain areas of information, enter this command: BASEBALL NOT WORLD SERIES for information about baseball, but nothing on world series data.

Note: Each data base or searching computer may have its own unique controlling search commands. Learning them and what they will do will help with your electronic researching. The commands between each system may vary.

- Always take advantage of off-peak hours. This means that you will be charged less for the service if you do your researching during evening hours or on weekends.

For additional information, please see our telecommunications column, "Connect! A Guide to Telecommunications Literacy." C

What Next for Commodore?

Things look bright with Tom Rattigan at the helm.

by Dan Gutman

One thing stands out when you walk into Tom Rattigan's office: There is no computer. The only sign that the office belongs to the president and chief executive officer of Commodore International Ltd. is a preliminary sketch of a new Amiga computer lying casually on the couch. That reminds you that nobody else in the world has the final word on the design of that machine except for him.

"I never got beyond the slide rule," he admits. "Calculators were the next generation, and computers were the next, so I'm sort of two generations behind."

But he wasn't brought to Commodore in April, 1985, for his computer expertise. You don't become a techie by spending eight years at General Foods and 14 years at Pepsi, even if you did get your MBA from Harvard. Rattigan was brought in for his business savvy. Commodore has had its ups and downs over the last few years and a good businessman was needed to turn things around.

It worked. Commodore has been revived, turning a profit the last three consecutive quarters. The company's stock has doubled in the last year, and the next generation Amiga is about to hit the market.

When Rattigan talks, he ticks off his points one at a time, in order, like a verbal outline. It doesn't matter whether he's selling cases of Pepsi, boxes of cereal, or Commodore 64's. What's important is that he sells them.

Gutman: Tell me about your plans for new Commodore products.

Rattigan: What we are doing is the continuation of what we've done in the most recent 18 months. From March to December, 1985, we introduced five new products: the 128, the 128D in Europe, the PC-10 and PC-20 IBM-compatibles, and the Amiga. This quarter [December, 1986] we've got another new product, the PC-40 in Europe, and two new Amiga products in the first half of 1987 that we think really take advantage of the technology and are going to be red hot machines for us.

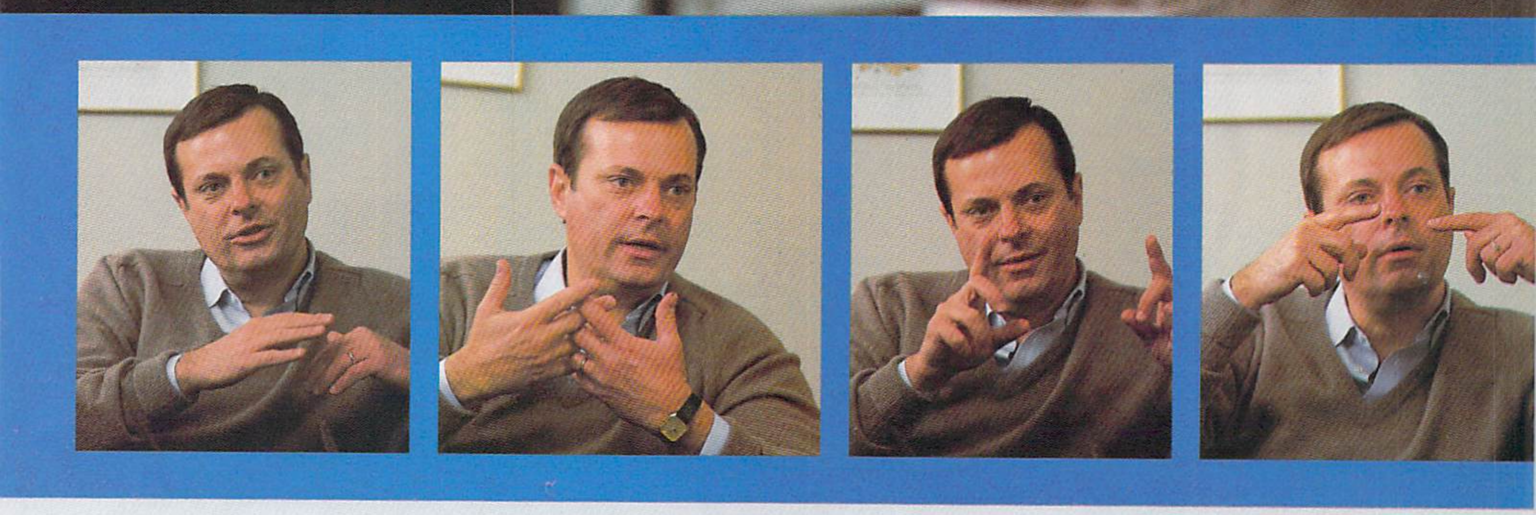
Gutman: Are you talking about the "little Amiga?"

Rattigan: That's one of them, yes. The machine will be based on existing Amiga technology. It will be totally software compatible, with 512K memory versus the existing 256, and it will be more competitively priced. We've got a library of over 300 Amiga software titles now and it's increasing on a weekly basis. We expect to do very well on that machine.



Commodore's CEO, Thomas J. Rattigan, sees new products, continued strength for the Commodore 64/128 and fantastic potential for the Amiga.





Gutman: What does more competitively priced mean?
Rattigan: Well, the Amiga 1000 was introduced at $1,295. This one will be substantially less than that, by about half.
Gutman: What about the "big Amiga?"
Rattigan: Number one, it will be truly an expandable box. It will be a multi-slotted, multi-drive machine with instant IBM compatibility if you so choose. The little Amiga is more a consumer machine. The other machine will be a high-end machine for business and workstation usage. It will have that kind of potential.
Gutman: So the bigger Amiga will be IBM-compatible without a Sidecar [device that allows the Amiga computer to run IBM-compatible software]?
Rattigan: It will be IBM compatible when you put a card in one of the slots.
Gutman: And you're bringing the PC-10 and PC-20 over from Europe?
Rattigan: We expect to be really in that business in the March quarter.
Gutman: Why? Isn't the IBM-compatible market crowded enough already?
Rattigan: No, for several reasons. First of all, we've already demonstrated success in Europe. We are number three or four there in business systems, and number two in Germany. A lot of people coming into the MS-DOS world now are new, and we're already in the business. I think we're as good as anybody else.
Gutman: When will Sidecar be available?
Rattigan: Sidecar has already been released in Europe. I was in Europe last week and it's already selling there. In the U.S., probably not until the March quarter. We've been late on that for a host of reasons.
Gutman: What's the future for the Commodore 64 line?
Rattigan: With over six million 64's out there, along with a million 128's, it will continue to be the most important single entry we have in our mix, but will decline over time. But I think it's going to be a lot of years before it's less than 50% of our total units. It's got too much going for it.
Gutman: How about a Commodore laser printer?
Rattigan: As we upgrade our product line, that definitely has to be part of our portfolio, particularly with that higher end Amiga.
Gutman: Commodore is giving a lot of support to the QuantumLink telecommunication service. Is it because you think telecommunications is the future of computing?
Rattigan: Most of the services are a step ahead of their time. CompuServe [the largest telecommunication service in the U.S.] has only 300,000 subscribers. Taking into account the installed base of computers in the U.S., telecommunications really isn't that large of a factor in the industry yet. We think it will be over time, so it makes sense to have some presence in that segment of the market.

Three years ago, people were talking about telecommunications being just around the corner—the world of the future. There's probably been some disillusionment about that, but we're committed to it. We've got an investment in QuantumLink, in addition to supporting them and co-marketing their service, and they've done a good job from a zero start.
Gutman: A lot of people seem to think the Amiga would be a terrific home machine, but Commodore seems to position it as a business computer. Which is it—a home computer or a business computer?
Rattigan: I don't think we've positioned it as either. I think we banked a little too much on the software emulator [the "Transformer"] for IBM compatibility, which we saw as a bridge during the time Amiga's software was being developed. That obviously, in retrospect, did not pan out to the degree we had hoped.

We think the Amiga is an economical alternative for somebody at home who casually wants to use IBM programs.

We were overly optimistic about software development, but I guess that's traditional in the industry. I think we've caught up and turned the corner on that one.

I think the price also confused a lot of people. People seem to think that home systems are under $1,000 and business systems are over $1,000. There tends to be a lot of biases and preconceived notions as to exactly what differentiates home and business computers.

We still believe the potential of the Amiga is absolutely fantastic. I don't think we did as good a job as we could in alerting the consumer as to the specific benefits of the machine. But we'll make up for that.
Gutman: What place do you see for the Amiga in business?
Rattigan: I think two things are going to happen. Commodore, on the corporate side, has not been a major factor in the U.S. business market as it has been in Europe. The recognition of the MS-DOS environment is an absolute necessity. Whether people choose to use it or not, that's their business. But the fact that they've got the potential of using it is important to a lot of people.





And number two, if you've got a machine with multiple-processor capability like the Amiga, the people who know what to do with it are going to find that kind of a machine fascinating. I don't think the higher end Amiga is going to go into accounting departments, but I do think it is going to go into areas where there is a degree of creativity, if you will.

Q: What would you do if your granddaughter brought home an Atari ST?

A: I'd probably send her off to have her IQ tested.

Gutman: You mean ad agencies, studios and the like?

Rattigan: Well, we said that before and we didn't deliver on it. Part of it was that we didn't have the software. Even in a marketing department in a company, graphics can be important. The thing everybody overlooks with desktop publishing is that almost everything most of us deal with is still in the written form. The Amiga takes more advantage of both words and graphics than anything on the market.

Gutman: At the Comdex computer trade show in Atlanta, somebody had the Polaroid Palette [a product to make photos and slides directly off the monitor] hooked up with an Amiga to make presentation graphics.

Rattigan: Yes, we're doing things like that, but that is not going to be the reason why the machine is sold. Features like that are going to be nice add-on features. You'll have your digitizers, frame grabbers, palettes, and laser printers. All of that is going to come along. But if we're fortunate enough to hit a home run, like our friends at Apple have done, with desktop publishing—fine, so much the better.

Gutman: We all know about the computer industry Catch-22. A computer doesn't sell until there's a good software library and there's usually no software library until the computer sells. Isn't it infuriating to you when software publishers say they're going to wait until the machine is successful?

Rattigan: Well, I don't know if it's infuriating. They have businesses to run, too. It's not three guys in sweatshirts in a garage anymore. They've got obligations to themselves and their shareholders. I think the days of El Cid coming over the horizon to commit a software company to one machine are over. That's one thing when you've got 15 people in the company, but it's another when you've got 300.

Of course, there are exceptions. We had some support like that. Trip Hawkins at Electronic Arts did a good job for us with *Deluxe Paint* and other programs that played to the strengths of the machine.

Gutman: What's the software community doing with the 128 and Amiga?

Rattigan: For the most part, the people who have written for the 64 are the same people who are writing for the 128. By the end of 1986 we had sold in the range of a million 128's, which probably makes it the fourth or fifth most popular computer in the world in the last 15 months. A lot of that's because you've got three distinct operating systems in the 128—Commodore 64, 128 and CP/M. CP/M is not that important in this country, but in Europe there is an advantage, particularly in education.

In terms of the Amiga, I think the software community is seeing that we're going to be around for the long haul. Initially, there was reservation on the part of some people as to Commodore's future. But I think we've eliminated some of these doubts. First, we've re-established our fiscal credibility. Second, the new Amigas are more specifically targeted toward the home user or the professional market. Plus, both are going out in an environment where, as I said earlier, there are over 300 titles already.

Gutman: But you can't tell me any specific titles or programs coming?

Rattigan: Alan Ashton [of Ashton-Tate] and the *Word Perfect* [Word Perfect Corporation] guys have done some interesting stuff. Obviously, we've got to do something and we will be doing something in the desktop publishing area. There's a wide range of areas after that one. There's desktop video and so forth. Already Apple's talking about desktop engineering.

Gutman: What do you think is the most exciting program for the Amiga?

Rattigan: Probably the programs that Electronic Arts has done. I really think *Deluxe Paint II* is fantastic, because it plays to the strength of the machine. Of course, you've got another group of people who go crazy over *Marble Madness*. Beauty is in the eye of the beholder.

Gutman: Commodore sold about a million 128's in the first year. How about some worldwide total sales figures of your computers?







Rattigan: In the last two years we have sold about 2½ million machines each fiscal year—that's five million machines. In the most recent fiscal year we sold just a tad under two million 64's and 128's. The balance of the line made up the remaining 600,000 or so machines.
Gutman: This year, for the first time ever, Commodore increased prices. Why?
Rattigan: There were several reasons. Number one, we thought the 64 is a great value both before and after the price increase. It's one of the few computers the American consumer can still buy for less than $200.

Number two, we thought that with the addition of GEOS [software bundled with the 64C], there was real value in what you could do with that machine, in terms of the Mac-like features GEOS provides—icons, the mouse and so forth.

And, thirdly, to be quite candid, over the last year we looked at our expenses and selling prices and did what we think was in the best interest of the company. We came to the decision that it would be a smart thing to do.
Gutman: There's been some criticism that it was pointless to take the 64, wrap a new "skin" around it, and call it a 64C. Did you do it just for appearance?

"If [Jack Tramiel] were sitting here, it would be the first time I ever met him. He smokes cigars, so he can't be all bad."

Rattigan: No, that's not the only reason. There was a fair amount of internal debate over the design. Some people felt it was the Volkswagen in the line, and look what happened to Volkswagen when they fooled around with the Beetle. It was not a decision that was casually arrived at. There were some fairly heated discussions.

With the launch of the 128, where the design of the computer and the color are different [from the original 64] but there is an overlap on peripherals, it made sense to go with something [for the 64C] where the appearance was compatible. I think you've got to give people an opportunity not to have a black monitor, a green CPU, and a red disk drive.
Gutman: What's your response to people who say there's no such thing as a home computer market?
Rattigan: I don't know. Based on the numbers I see, there were 2.7 million computers sold into the home in 1985. There were 3.5 million in 1984, a twenty-five percent unit decline. My God, the world's ending! Sure, the industry hit a plateau, but it was also going through a tremendous shakeout period in 1984 and 1985.

I think the home market is alive and well, and in terms of installed base, we're the number one player. It's very, very important for us as we come in with higher end machines to continue to dominate that sector, because that gives us a reservoir of users familiar with our products to grow with. It's far better to have a Chevrolet owner want to buy my Cadillac than attempt to get a Ford Fairlane owner into it.
Gutman: Why does the industry consider the home computer a dirty word?
Rattigan: Because so many people got killed who went into the business. It gets back to expectations. People like to write about this industry. In its halcyon days, if somebody [in the industry] went to church on Sunday, that was a headline. Everything was wonderful and the industry was growing 40, 50, 60, 70, 80, 90 percent a year. Everybody was confident, agressive. It's always fun to write that kind of story.

All of a sudden it slowed down and everybody went crazy. I think the industry has come back to dead center. It really has. If you look critically at the numbers, the industry has made real progress in the last year.
Gutman: Does it bother you that Jack Tramiel and John Sculley are media celebrities, but not many people know your name?
Rattigan: What we want to do with this company is, obviously, substantially improve its performance. When you have lost something in the range of $270 million in five quarters, I don't think it's time to be a media celebrity. I think it's time to get back to your knitting and figure out how you're going to get the company making money.
Gutman: Well, now that things have turned around you'll become a media celebrity, right?
Rattigan: Not really. They haven't totally turned around. Sure, we had a $125 million profit improvement over the June quarter last year. By any standard, that's great. However, my issue with that is that we did $209 million in sales and only $1 million in profit, and I don't think that's a very good performance. I think there's some good news and bad news in that scenario. Tremendous improvement, but not an acceptable performance.

Continued on pg. 126





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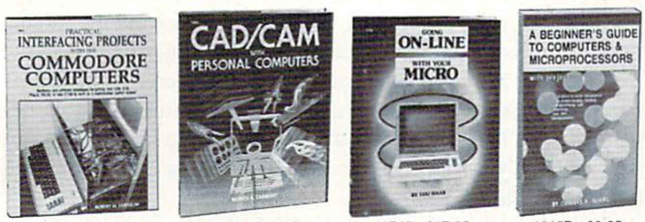
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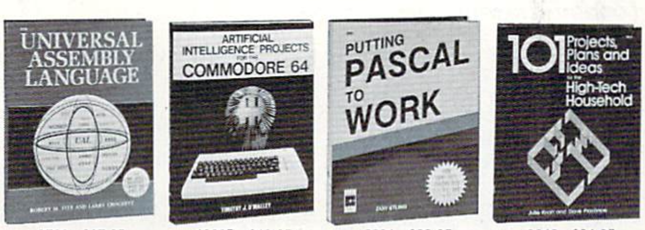
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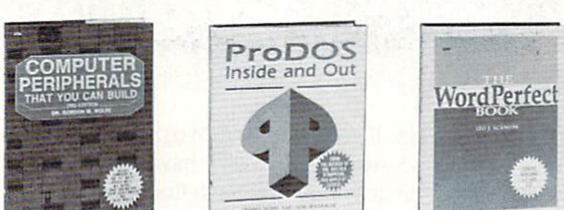
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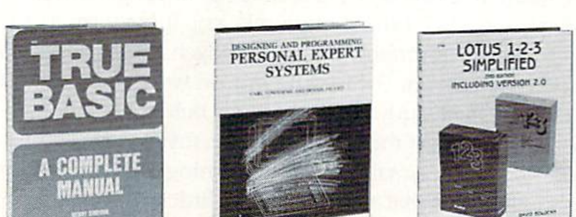
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Tips & Tricks

COMPILED BY LOUIS F. SANDER

Hints for Fun and Utility

Every month, this column brings you a super collection of tips and tricks from all over the world. In selecting the items to print, we keep in mind the needs of people at all levels of computing, from beginner to machine-language programmer. We try to have something for everybody, and if our huge volume of mail is any indication, we are succeeding very well.

This month's collection features numerous tips from the world of math, several hints to lessen your program debugging time, and a library of useful sound effects for Commodore computers. As always, though, there's a veritable potpourri of tips and tricks on a wide array of subjects.

If you have an idea, tip or trick that you'd like to share with others around the world, write it up and send it in (only one tip per sheet of paper, please). We pay from $10 to $50 for each item we use. Send your tricks to:

Louis F. Sander
P. O. Box 101011
Pittsburgh, PA 15237

When you send in your tricks, let us know what you think about the column. If you include a self-addressed stamped envelope, we'll send you our Trick-Writer's Guide. International readers may omit the stamp.

Bytes: A byte is the elementary unit of storage in Commodore computers and many others. For practical purposes, a byte can be thought of as equivalent to one printed character. The word Commodore then, with nine letters, would take nine bytes of storage space on a disk or in main memory.

A kilobyte, or 1K, is 2 ↑ 10 bytes or 1,024 bytes. It gets its name from the Greek prefix meaning one thousand, even though strictly speaking it isn't a thousand bytes. The number 1,024 is used because it's the power of two closest to 1,000.

A megabyte, often used in measuring the storage capacity of hard disks is 1024K or 1,048,576 bytes.

There are about 2,000 characters on a double-spaced typewritten sheet of paper, so all the text on such a page could be stored in about 2K of memory or disk space. One disk in a 1541 drive holds about 175K bytes, or the equivalent of almost 90 double-spaced typewritten pages. Since the 1571 drive is double-sided, its disks can hold 350K bytes of information, or about the same as that in 175 typewritten pages.

The smaller hard disk drives commonly used in IBM-PC's and clones will hold 10 megabytes of information, or over twice the number of characters as in the King James version of the Bible.

Thomas Lawlor
Ross Township, Pennsylvania

Easy large numbers: If you need a large number, you can save keystrokes and memory by using the up arrow key on exponential notation. It's easier to type 10 ↑ 6 than it is to type a million, and it's almost as easy to type 10E6.

Sam Hertzler
Carlisle, Pennsylvania

Working with large numbers: The largest number that your computer can represent is approximately 1.7 times 10 to the 38th power, or 1.7E+38 in exponential notation. (This is the number 17 followed by 37 zeroes.). While that is a very large number, on occasion it's too small for your needs. (If a calculation attempts to exceed the limit, an Overflow Error results.)

If you use a few programming tricks, you can use logarithms to handle numbers larger than your computer's limit. When using logarithms, multiplication becomes addition, division becomes subtraction, and exponentiation becomes multiplication. For example:

LOG(X*Y) = LOG(X) + LOG(Y)
LOG(X/Y) = LOG(X) - LOG(Y)
LOG(X ↑ Y) = LOG(X) * Y

The accompanying program illustrates how logs can be used in calculating factorials. If you calculate factorials normally, you will get an overflow for anything higher than the factorial of 33. With our program, you can go a lot higher than that. For example, running it for N=100 gives N!=9.3326192 E 157.

R. W. Grym
London, England

```
100 PRINT"FACTORIAL FINDER - A.W.GRYM
    [DOWN]":REM ILLUSTRATES USE OF
    LOGARITHMS
110 INPUT"N";N
120 F=LOG(1):FOR Z=1 TO N:F=F+LOG(Z)
    :NEXT
130 F=F/LOG(10):E=INT(F)
    :M=10^(F-INT(F))
140 PRINT"N!=";M;"E";E
```

Binary for beginners: If you want to move past the beginner stage in computing, sooner or later you'll have to become fluent in working with binary numerals. Such fluency is absolutely essential when working with machine language, and it's helpful when working in advanced areas of BASIC. For a detailed explanation of binary numerals, you'll have to go to a book—good programming books usually have a chapter or section on the subject. For useful hints on working with what you find there, just study the paragraphs below.

When I moved past the beginner stage, my first accomplishment outside the decimal world was learning to count in binary; you should learn that, too. With just a little practice, it's easy to write all the binary numerals from 0000 (0 in decimal) to 1111 (15 in decimal). After you've done that several times,

Tips & Tricks

you'll be very able to use those patterns to count as high as you'd like.

It's also helpful to learn how to convert binary numerals into decimal form. Just start at the right and remember that the first place is the units place, the second is the 2's place, the third is the 4's place, and so on through 8's, 16's, 32's, 64's and 128's. Use a calculator to get the total and soon you'll be a binary whiz.

You can convert decimal numbers to binary by repeatedly dividing the decimal numeral by two, taking the remainders as the bits of binary numeral. The remainder from the first division is the least significant bit (LSB), or the rightmost bit in the binary numeral. The remainder from the last division is the most significant bit (MSB), or the leftmost bit of the binary numeral. The other remainders become bits from right to left. Here's an example of how to convert 19 decimal to binary.

19/2 = 9, remainder 1 (LSB = 1)
9/2 = 4, remainder 1 (next bit = 1)
4/2 = 2, remainder 0 (next bit = 0)
2/2 = 1, remainder 0 (next bit = 0)
1/2 = 0, remainder 1 (MSB = 1)

As you can see, the binary equivalent of 19 decimal is 10011.

To avoid confusion between binary and decimal numerals, computer people often use a special notation to differentiate the two. The prefix % is often used for binary, while decimal usually has no special prefix. Therefore, %10011 is instantly recognizable as the binary equivalent of 19, while 10011, under this convention, would be the decimal numeral for 10,011.

To become a really advanced binary expert, you'll want to commit some binary numerals to memory. Binary 0000 is easy, of course, and 1111 isn't much harder. 1010 is easy, too, since it's equal to decimal 10. Once you've memorized the other binary numerals between 0000 and 1111, you can consider yourself an expert, and you can amaze your friends with your knowledge. You'll also be very prepared to make the move into hexadecimal.

Louis F. Sander
Pittsburgh, Pennsylvania

Binary conversion programs: The accompanying programs convert binary numerals to decimal, and decimal numerals to binary. After you've learned to work in binary notation, they can make your life much easier. They're also useful in learning about binary, since they let you see exactly what converts into what. The actual work of conversion is done in lines 130 and 230; the other lines merely demonstrate the process. I've used both routines many times in larger programs, and from time to time they really come in handy.

Louis F. Sander
Pittsburgh, Pennsylvania

```
100 PRINT:PRINT"BINARY TO DECIMAL
    CONVERTER - SANDER":PRINT
110 PRINT"INPUT MUST BE ALL 1'S AND
    0'S, WITH":PRINT"NO SPACES,
     PLEASE!":PRINT
120 INPUT"[SPACE4]BINARY NUMERAL";B$
130 D=0:FOR J=1 TO LEN(B$)
    :D=D+D-(MID$(B$,J)=>"1"):NEXT
140 PRINT "DECIMAL EQUIVALENT=";D
```

Tips & Tricks

```
200 PRINT:PRINT"DECIMAL TO BINARY
    CONVERTER - SANDER":PRINT
210 PRINT"INPUT MUST BE BETWEEN 0 AND
    255":PRINT
220 INPUT"[SPACE2]DECIMAL NUMERAL";D
230 B$="":FOR J=0 TO 7:B$=CHR$(D AND
    1 OR 48)+B$:D=D/2:NEXT
240 PRINT"BINARY EQUIVALENT= ";B$
```

Easier bug-spotting: Sometimes the hardest part of debugging is finding the offending bit of code in amongst all the lines of good stuff. If you list your program on the printer, you'll be surprised how the bugs become more visible.

Another debugging secret is to simultaneously press the SHIFT and Commodore logo keys to put the computer into upper/lower case mode. If you've managed to use the letter O where a zero was required, or if you've substituted a one for an I, the lower-case display will make your error more obvious.

When you're looking for a bug in an on-screen listing, it's usually helpful to change your cursor color to something different than the color of the letters. Then move the cursor character by character over your listing, and keep your eyes out for errors.

Bob McAfee
Ross Township, Pennsylvania

Debugging using STOP and CONT: These two statements were created as debugging aids, but it's surprising how many people don't know how to use them.

When the computer encounters a STOP command, program execution ceases and a message appears on the screen. The message is BREAK IN LINE XXX, where XXX is the number of the line in which the STOP was found. After the error message, of course, you'll see the READY prompt and a flashing cursor.

The neat part of all this is that program execution can be resumed by typing CONT and pressing RETURN. The computer will begin by executing the statement immediately after the STOP, and all variables will contain their previously existing values.

So if you want to know whether a certain part of your program is being executed, temporarily put a STOP statement in it somewhere. If you get the BREAK message, you'll know that its own line, at least, is being processed. Then to continue, just enter a direct mode CONT.

In a complicated debugging situation, you can embed several STOPs in the program. Like the obedient servants they are, each one will identify itself by line number, and you can use CONTs to step right through them.

You can even use STOP in debugging a multi-statement line where you can't find the source of the error. Put a STOP after the first colon in the line, then run the program. If it reaches the STOP, you know that everything up to that point is okay. Now list your line, delete the STOP, and insert another STOP after the second colon in the line. Repeat the process until you get your Syntax Error instead of a Break. When that happens, you know that the error is somewhere between the STOP's previous and present locations.

Orkin Rollins
Hemiptera Lake, Florida

Debugger's nightmares: Some of the worst debugging problems occur when the computer reports an error in a line other than the line that contains the error. Several conditions can cause that situation, and unless you're aware of them, you could spend lots of time and energy looking for a mistake in a perfect line.

Usually these problems occur in READ-DATA statements or in user-defined functions (DEF FN). Here are two examples of what can happen. Study them now and you might remember them when the debugger's nightmare happens to you.

First, consider these two lines, which could be two isolated lines in a larger program of some sort.

```
100 FOR J = 1 TO 3 : READ K : NEXT
500 DATA 10,20,OOPS
```

Line 100 is looking for three numeric DATA items, but the third DATA item is a string. When the program attempts to read that item, the following error will occur.

```
?TYPE MISMATCH ERROR IN 100
```

Unless the programmer is in the know, he or she can waste a lot of energy examining line 100, which doesn't have an error at all.

Here's another example.

```
100 DEF FNA(K) = NEXT
800 B = FNA(K)
```

There is an error in line 100, since NEXT is illegal as a definition for a function. But when line 100 is executed, the computer will not detect the error! That won't happen until line 800 is executed, at which time the following message will appear.

```
?SYNTAX ERROR IN 800
```

Much as with the READ-DATA error, the problem is in a line referred to by the reported line, rather than in the reported line itself. Pity the man who loses sleep while trying to correct line 800.

Well, there they are—two nightmares that can keep you awake for many nights. Be aware of them, and hope that you remember this article when they come into your life.

Louis F. Sander
Pittsburgh, Pennsylvania

Sound library: Here are some simple but elegant sound effects for Commodore computers. They work identically on the 64 and 128. The sound effects are listed together here to save space, but each is intended to stand by itself as a program or a subroutine.

Lucy Terrier's Buzzer Sound is a very simple buzzer, such as might be used to signal a wrong answer. It's hard to get 64 sound with any less programming than this.

Chris Trautman's Better Buzzer shows what can be added to Lucy's simple routine (notice that line 110 is identical in both programs). It adds some tones to the buzzer, lessening its harshness significantly. For more variations, in line 105 change the values after the commas in POKE S,10 and POKE S+1,40. The new values can be anything between 0 and 255, but they should not both be zero at once. You can also change the POKE S+4,33 in that line to ,17 or ,128.

Anna Mae Hertzler's Bell Sound routine gives a clear tinkling bell. It's another simple one and it really sounds nice.

Greg Long's Helicopter will make you think Airwolf is hovering outside your window. To make the sound last a longer or shorter time, change the 100 in line 320.

Ron Newbery's Beep Routine will give one or more beeps, depending on how many times line 440 is called as a subroutine (line 420 calls it twice in our example). Once line 410 has

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been executed, just GOSUB 440 to get a beep.

Finally, Mitchell Ross has given us a nice Explosion Maker. By changing the values of D and F in lines 510 and 520, you can get anything from a rifle shot to an avalanche. Have fun exploring the world of explosions.

Louis F. Sander
Pittsburgh, Pennsylvania

```
100 REM BUZZER SOUND - LUCY S. TERRIER
110 FOR J=1 TO 1Ø:POKE 54296,15
    :FOR K=1 TO 5:NEXT:POKE 54296,Ø
    :FOR K=1 TO 5:NEXT:NEXT
    :
1ØØ REM BETTER BUZZER - CHRIS TRAUTMAN
1Ø5 S=54272:POKE S+6,24Ø:POKE S,1Ø
    :POKE S+1,4Ø:POKE S+4,33
11Ø FOR J=1 TO 1Ø:POKE 54296,15
    :FOR K=1 TO 5:NEXT:POKE 54296,Ø
    :FOR K=1 TO 5:NEXT:NEXT
115 POKE S+4,128
    END
    :
2ØØ REM BELL SOUND - ANNA MAE HERTZLER
21Ø S=54272:POKE S+1,112:POKE S+5,1Ø
    :POKE S+6,9:POKE S+24,15
    :POKE S+4,17:POKE S+4,16
22Ø END
    :
3ØØ REM HELICOPTER - GREG LONG
31Ø S=54272:FOR J=Ø TO 23:POKE S+J,Ø
    :NEXT:POKE S+24,15:POKE S+6,24Ø
    :POKE S+4,17
32Ø FOR J=1 TO 1ØØ:FOR K=9 TO Ø STEP-1
    :POKE S+1,K:NEXT K:NEXT J
    :REM J CONTROLS DURATION
33Ø END
    :
4ØØ REM BEEP ROUTINE - RON NEWBERY
41Ø S=54272:POKE S+24,15:POKE S,2Ø
    :POKE S+1,2Ø:POKE S+2,1Ø
    :POKE S+3,1Ø:POKE S+6,128
42Ø FOR J=1 TO 2:GOSUB 44Ø:NEXT:END
43Ø REM SUBROUTINE TO CALL FOR A BEEP
44Ø POKE S+4,65:FOR K=1 TO 9Ø:NEXT
    :POKE S+4,Ø:RETURN
    :
5ØØ REM EXPLOSION MAKER - MITCHELL
    ROSS
51Ø D=9:REM DURATION (Ø-15)
52Ø F=7:REM FREQUENCY (Ø-255)
53Ø S=54272:FOR L=1 TO 24:POKE S+L,Ø
    :NEXT
54Ø POKE S+1,F:POKE S+5,16+D
    :POKE S+24,15
55Ø POKE S,24Ø:POKE S+4,129
56Ø END
```

User group meeting rooms: When choosing a place to meet, you should consider other factors than just the size and cost of the room. Many groups meet in schools or in the members' homes; both places are economical, but they don't have much walk-in traffic, so they're not likely to attract new walk-in members. Neither do they have anything to amuse the spouses, parents or other family members who often drive the members to the meeting.

We've found that shopping malls and public libraries are much better places to have our meetings. Both places usually have meeting rooms that are open to the public, and if they aren't free, their rates are very low. Both places also have a wide range of attraction for family members, and plenty of things to amuse them while you are at your meeting. If you put up signs, you'll certainly attract some new members from the crowds at the mall or the library. The easy-to-find non-threatening aspect of such places makes them very attractive to those who'd like to join but suffer from some reluctance.

Pittsburgh Commodore Group
Pittsburgh, Pennsylvania

C128 symmetrical scaling: One of the problems with the 128's wonderful graphic commands is that there are different scales on the X and Y axes. (If you draw a circle, you'll see what I mean—it's more like an egg.) The SCALE statement can be used to correct this distortion.

For my 13″ diagonal monitor, SCALE 1,2327,2000 makes both axes symmetrical. After executing that statement, CIRCLE 1,1000,1500,300,300 is a perfect circle, and BOX 1,900,900,1200,1200,,1 is a perfect square. If your own monitor shows something different, adjust the 2327 up or down until you get what you want (My 1902 worked well with SCALE 1,2500,2000. LFS.).

Glen Ritchie
Bismarck, North Dakota

Using key-protected software on the C128: Upon activating my new 128, I quickly found that I was unable to use the key or dongle from either *Paperclip* or *The Oracle*. (These keys are little gadgets that plug into the joystick port; they're

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used for program protection. An overhang on the 128's case keeps them from being plugged in properly.) I solved the problem by plugging the key into my joystick extension cable, then plugging the cable into the joystick port. Such cables are available at Radio Shack and at many computer stores.
Arthur K Yellin
Olney, Maryland

C128 auto load/run: The F8 key, or any F-key, can easily be redefined to let you use a Directory listing to automatically load and run BASIC programs. In direct mode, type

KEY 8,"RUN [TAB key 3 times]
[SPACE bar 3 times]" + CHR$(13)

Using a disk directory listing, place the cursor on the line for the program to be run. When you press the F8 key, the program will load and run automatically.

If you use the word LOAD instead of RUN, the F-key will load the program but won't automatically run it. If you'd like, you can put the key redefinition into a program rather than doing it in direct mode.
Fred C. Krause
Pittsburgh, Pennsylvania

Cartridge lifesaver: Sometimes after heavy use, a cartridge will fit loosely in its slot and will tend to disconnect when the keyboard is bumped. If this happens to you, don't throw the cartridge away!

Instead, go to a sewing store and buy two feet of thin elastic. Put your cartridge in place, then wrap the elastic around the computer's body and the cartridge, allowing the elastic to lay between the function keys and the RESTORE key. Use a safety pin to make the elastic into a snug loop, then enjoy your cartridge for a few more years. When you aren't using a cartridge, you can remove the elastic or leave it in place.
Walt Latocha
Oak Park, Illinois

Disk storage: An old 45 RPM record holder of the steel wire type makes a good disk holder and desktop storage device.
Peter Natale
Golden's Bridge, New York

Disk stick fix: If your disk drive should get jammed at or above track 35 making your drive useless, there's a very easy way to correct the problem. Just take that strange piece of cardboard that came inside the drive (you do still have it, right?) and put it back in the slot. The tab on the back of the cardboard will push the head back to track 1, and your drive will be ready to use!
Perry Rothermel
Waltham, Massachusetts

MPS-803 tractor modification: If you have Commodore's MPS-803 printer with the optional tractor feed unit installed, you've probably noticed that the tractor feed unit makes the paper advance knob hard to get to. This is due to a small plastic guard on the left end of the tractor feed, which always seems to get in the way when you want to position your paper. Since the guard is held on by one small screw, I removed mine, and now I can get at the paper advance knob. I put the screw back in its original hole, and I saved the plastic guard where I can get it if I ever need it.
Matt Zuhlke
Lake Mills, Wisconsin

Plotter supplies: If you have Commodore's very nice 1520 printer/plotter, you know that finding paper and pens can be very frustrating. But the cure is as close as your nearest Radio Shack store. Radio Shack's PC-2 printer takes the same supplies as the 1520, and these supplies are available at any Radio Shack. Black pens are #26-1480A, and assorted colored pens are #26- 1481A. Each is about $3 for a three-pack. The paper is #26-1428, and comes in a three-roll box for about $5. If your local store doesn't stock these items, ask the manager to order them for you.
Michael Hale
Gaithersburg, Maryland

Machine-language hint: Here's a little trick for machine-language users. Instead of using JSR $FFD2 to print ASCII characters on the screen, you can use JSR $E716 to output to the screen regardless of the current output device. This way you can do things like sending messages to the screen while outputting to the printer.
Gregory Houston
Clanton, Alabama

Summer Games trickery: The World Records for this disk are stored on track 15, sector 5, under the name WR. If you have a track and sector editor, and if you can stand a little innocent cheating, you can change the records to whatever you'd like. Never make such changes on your original disk, since one mistake could put you on injured reserve forever. For safety's sake, use your backup copy.
David Lu
Tucson, Arizona

Abbreviated DATA statement: Instead of entering a zero in a numeric DATA statement, it's perfectly acceptable to leave that data item blank. For example, these two lines are exactly equivalent:

```
100 DATA 7,15,39,0,47
110 DATA 7,15,39,,47
```

Leaving out the zero is also said to speed up the reading of the DATA statement.

In string DATA statements, it's usually acceptable to leave out the quotation marks. If you leave out everything (as in the numeric example above), the data item will be read as a null string. For practical purposes, these two lines are identical.

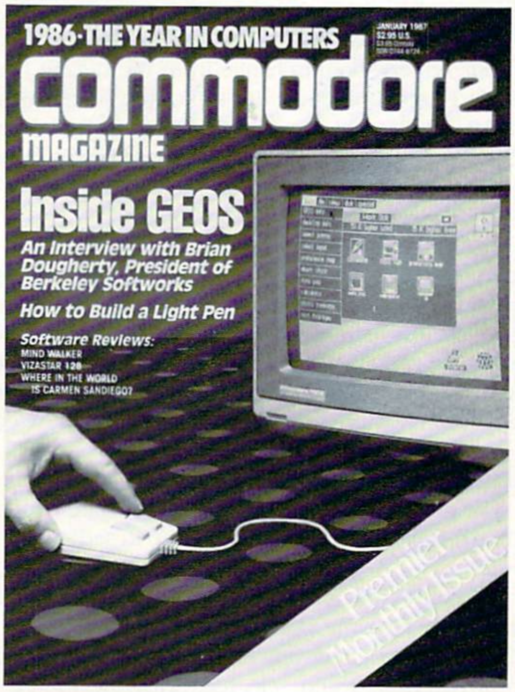
```
120 DATA "LOUIS","BILL","","TRACEY"
130 DATA LOUIS,BILL,,TRACEY
```

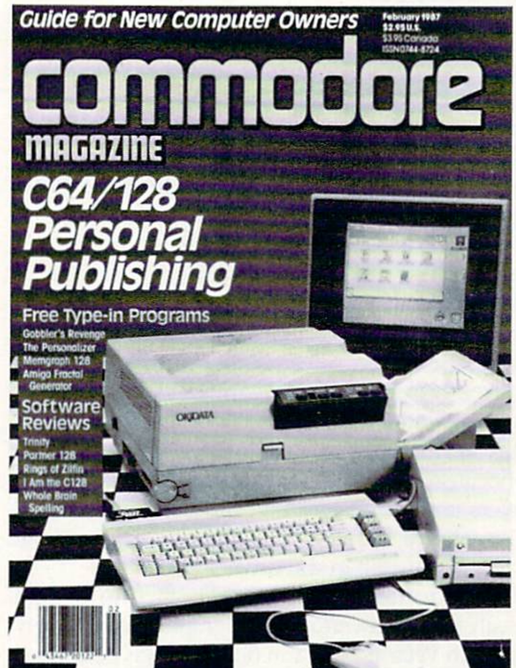
You *must* use quotation marks if your data items contain shifted characters, commas or colons. Unless they are enclosed in quotes, shifted characters will list improperly and give erratic results when read. Commas and colons will be interpreted as separators rather than as actual data.
Deglet Noor
Indio, California

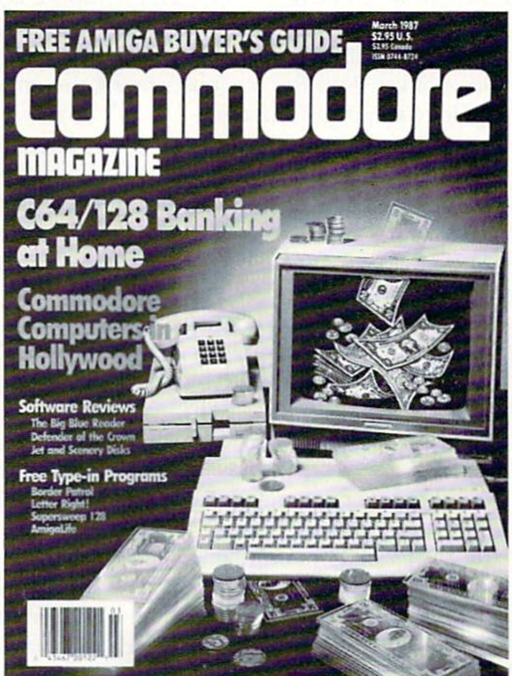
The ultimate tip: This hint is about graphics, sprites, music, mathematics, programming, hardware and software. It is compatible with any Commodore computer and is helpful for a great variety of peripherals and commercial software packages. Here it is: Never miss any issue of *Commodore Magazine!*
Luis Padua
Mexico City, Mexico

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BY JIM DAVIS AND DAVE WILSON

Vectors!

for the Amiga

The Amiga offers amazing features never before available in a moderately-priced home computer. Commercial software producers are taking advantage of the Amiga's 4,096 colors, 640 X 400 high-resolution bit-mapped graphics, multi-tasking operating system, stereo four-channel sound, and ROM-supported speech synthesis. Amiga users will no doubt gobble up the commercial software as it appears on the market, delighting in the speed and power of their new machine.

But for those of you who want to take the wheel yourself—for those who itch to rev that 16/32-bit engine—AmigaBASIC may be the answer. Several other programming languages are currently available for the Amiga, everything from Pascal to C to LISP, and those who speak those languages fluently may prefer to purchase a compiler in their native tongue. But because AmigaBASIC is bundled with the Amiga, because it offers immediate access to most features, and because BASIC is familiar to most, it may be the first language you choose to put yourself in the driver's seat.

Vectors! is hard to describe. It was designed to demonstrate how easily those powerful Amiga graphics can be driven via BASIC. With Vectors! you can draw endless patterns in 32 colors, save your creations to disk, and replay your creation at any time. While Vectors! uses many of the AmigaBASIC graphics commands, the program would not be possible without the MOUSE commands.

The mouse will be an essential ingredient in most Amiga programs. Since the Amiga uses the desktop metaphor, most users will necessarily become dedicated mouseketeers. Despite some critics' misgivings, the mouse is here to stay. Along with icons, windows and pull-down menus, the mouse creates a whole new language with which to communicate with the computer. The keyboard will never be completely replaced, but the mouse offers a shorthand method of interaction which should be utilized by the programmer whenever possible. Except for the load/save subroutine, which needs keyboard input for file names, Vectors! uses the mouse for all user input.

Run the program after you've entered and saved the listing. Vectors! will run on any Amiga configuration, but if you have the basic 256K machine and an external drive, you should disconnect the extra drive (it eats up 24K for a buffer). If you fail to do this, Vectors! will still run, but you'll have only four colors to work with. Those with a 256K machine but only the internal drive needn't worry, Vectors! should run fine.

If you have problems, it may mean Vectors! needs just a tad more memory. There are several procedures you can follow to free more memory for your programs. On your Extras disk, in the BasicDemos drawer, you'll find a program titled LIST ME which outlines some things you can do. You can free more than 2K by merely closing the List window before running a program, for instance. But be sure your program leaves Window 1 open, as Vectors! does, so AmigaBASIC has a window opened when your program ends. Otherwise you'll find yourself back in Workbench without a way to tell AmigaBASIC you're back! You'll then be forced to reboot.



Your screen should change from the default background color to a solid black. At the top of the screen window, the title VECTORS! will appear, and directly below this you'll see 32 colored boxes being painted. These boxes serve as your palette and the rest of the screen is your canvas. It is here that you'll be creating your animated designs.

Vectors! offers a full menu of options, but before you sample from the menu, try sweeping your mouse across the canvas with the left button held down. You should see several lines (vectors) shoot from your mouse pointer to the approximate center of the screen. If you move your mouse to the palette, click once there, and then return to the canvas. Any further vectors you draw will be in the new color.

About Those Menu Items

The menu options offered by Vectors! are RandomColors, MoveVertex, PlayBack, ClearCanvas, ResetRecord, Disk, and Quit.

RandomColors is a toggle switch. It's a special effect, and as implied by its name, offers random colors from the palette of 32. Simple, yet effectively flashy when used in moderation.

MoveVertex, when selected, arms the mouse for transplanting the center, which we call the vertex, to another spot on the canvas. Anywhere you click the mouse is set as the new center, and any further vectors you draw will shoot to and terminate there.

ClearCanvas does the obvious, erasing the entire screen. The palette is quickly redrawn.

PlayBack is the fun part of Vectors!. If you've drawn some vectors already, select PlayBack now. You should see everything you've done played back on the black screen. Color changes, vertex moves, canvas clears, and all vectors and recorded, and playing them back shows how easily animation is created on the Amiga, even in BASIC!

ResetRecord erases everything you've done, but doesn't clear the canvas. It's merely a way of starting over from scratch if you've drawn something that fails to enthrall. The recording is stored in three arrays. As you create designs, the array space is used up quickly. If Vectors! runs out of array space, you'll be notified by a beep. At this point you should save your design (if you wish to), and select ResetRecord to zero the array pointer.

The Disk menu option opens a second window, asking if you'd like to load, save or return to the main window. Any key pressed besides s or l will close the disk window and return you to the canvas. Select the save choice and you'll be asked if this is to be a new file (open), or, and here's where Vectors! gains some power, if you'd like to append the vectors in memory to an existing file.

It's possible to create animation routines that will last for hours simply by appending files. You can create your own animated graphics demo much like the PolyScope demo included in the Electronic Arts disk that came with your Amiga. By using a combination of Vectors! features imaginatively, you can easily create 3D animation, block letters, land-

scapes—all possible while barely tapping the Amiga's graphics power.

A quick simple example: Start with a clear canvas and grab a bright color. Sweep your mouse in a short circular motion around the vertex (left button down). Move the vertex, grab another color, and do the short circle again. Repeat as often as desired, and—voila! Instant, animated fireworks!

The load option is really a misnomer. Your graphics routines won't be loaded, per se. The file streams through, three Amiga words at a time. This method unabashedly takes advantage of the Amiga's great disk-access speed, and the difference between playback from disk and playback from memory is barely discernible. Those readers fortunate enough to have the 512K might want to modify the file buffer size, thus speeding disk playback to optimum.

How The Program Works

Vectors! is extremely simple, but it uses many commands that may be new to readers just starting to program in AmigaBASIC, so we'll concentrate our examination on two important subjects: using the mouse and modular programming.

Since the mouse does most of the input work, we'll start there. If you examine the Vectors! listing, you'll find the line ON MOUSE GOSUB Mouser:MOUSE ON. This line initializes the mouse for input. We're telling AmigaBASIC we want to know if the user presses the left mouse button. If the button is then selected by the user, AmigaBASIC jumps to our subroutine labeled Mouser. This is an example of event trapping, which is an integral part of most Amiga programs. Those of you who program in machine language are probably familiar with interrupts. An event trap is simply another term for an interrupt.

The MOUSE ON command is necessary because without it AmigaBASIC would ignore any mouse clicks. This allows a programmer to turn the mouse off and on at will, providing watertight control over the program's input (the complement command, MOUSE OFF, isn't used in Vectors!, but it could have been).

Let's look next at the first line of the Mouser subroutine, just a dozen or so lines down in the listing Mouser: GetMouseXY. Notice first that the subroutine labeled Mouser is followed by a colon. Without this trailing colon, AmigaBASIC wouldn't recognize Mouser as a line label, and there'd by a syntax error of some sort. The statement GetMouseXY brings us into the next realm of our examination.

Subprograms and the Modular Approach

Since AmigaBASIC makes it easy to merge separate BASIC programs, a programmer should never have to re-write often used subroutines. The modular approach to programming emphasizes the use of generic subroutines as blocks of code which can be thought of as macro-instructions. As our libraries of subroutines grow, we can almost create an entire program that will read like English. Vectors! uses two subprograms and several subroutines that can be used again and again in a variety of AmigaBASIC programs.

Subprograms can be thought of as independent subroutines, with a few extras thrown in. First of all, subprograms can be invoked two ways. You can use the AmigaBASIC keyword CALL, or you may simply call the subprogram by using its name. In Vectors! I chose to skip the CALL keyword because, quite simply, I like the way the listing reads. Others may prefer, or even insist, that the CALL keyword be included to insure that it's clear to one and all that a subprogram is being invoked. Whichever syntax you choose, remember that any values you pass to the subprogram must be enclosed in parentheses if you use the CALL keyword. If you call the subprogram by its name, you don't need (and AmigaBASIC doesn't want to see) the parentheses. Thus, we could have said CALL GetMouseXY or GetMouseXY.

A subprogram can be passed values by the calling program, it can share the main program's variables and constants, it can use its own variables, or it can do its job independently, without needing any variables at all. The GetMouseXY subprogram in Vectors! shows how a subprogram shares values with the main program. The keyword SHARED lets AmigaBASIC know that the subprogram wants access to the global variables X and Y. If the SHARED statement was omitted, GetMouseXY would fail in its job, which is simply to find out where the mouse is whenever the left button is pressed. It would find out alright, but it wouldn't SHARE its knowledge with the main program. AmigaBASIC would treat the X,Y used by GetMouseXY as different variables than the X,Y used in the main program. This failure to communicate would make GetMouseXY functionally useless.

GetMouseXY could have been written without the SHARED statement, if we wanted. We could choose to pass values back and forth within the parentheses. An example of this can be seen in the RGB subprogram which immediately follows GetMouseXY.

```
SUB rgb (reg,r,g,b) STATIC
    c! = 1/15
    R! = c!*r:G! = c!*g:B! = c!*b
    IF reg < 0 OR reg > WINDOW(6)
       THEN exit RGB
    PALETTE reg,R!,G!,B!
exitRGB:
END SUB
```

The SUB statement identifies this section of code as a subprogram and should be followed immediately by the subprogram's name (rgb), an optional list of variables (enclosed in parentheses), and the keyword STATIC. Everything that follows this program line is considered part of the subprogram, until AmigaBASIC reaches the END SUB keyword, which corresponds to the RETURN statement needed by subroutines.

There are four variables enclosed in parentheses in this subprogram, so when we invoke rgb we must send it a like amount of data. In Vectors! we call rgb several times. One call is simply rgb 1,0,0,0. We call rgb by its name and pass it four whole numbers separated by commas. Those variables named in the subprogram's definition are assigned these values in their proper order. The variable reg will have a value of 1, while r, g, and b all get zeroes.

Elsewhere in Vectors! (in the InitColors subroutine), we call rgb using variables instead of naked numbers. The statement rgb i,red,green,blue makes reg=i, r=red, g=green, and b=blue. The subprogram then uses these values as it performs its tasks.

Note that since rgb expects four values, you must send it four values or you'll be notified by AmigaBASIC that there's an Argument Count Mismatch. Similarly, the data you send must match in type. In rgb, the arguments listed are all of the

integer type (we declared earlier in Vectors! that all untagged variables will be integers with DEFINT a-z), so when we call rgb we must send it integer values or we'll be beeped by AmigaBASIC with the message Type Mismatch.

The other variables used in rgb are local. AmigaBASIC assigns the value of 1 divided by 15, for instance, to the variable c! (the exclamation point tags this variable as single-precision), but if you wanted to use the same variable name in the main program, you could. Unless you declare a variable to be SHARED, AmigaBASIC treats it as local and assigns it a unique location in memory. Thus c! in the main program and c! within rgb can hold two different values simultaneously. This feature enhances the modular approach to programming, because as a programmer you needn't worry that variables from your library of subprograms might one day conflict with a main program. We can MERGE rgb with any main program, even if that program uses the same variable names.

A detailed discussion of subprograms is provided in the Advanced Topics chapter of the AmigaBASIC manual.

That Wonderful Mouse

Now that we have an understanding of subprograms, let's look at the GetMouseXY subprogram. Short and simple, with only four statements between the SUB and the END SUB, GetMouseXY performs its task efficiently. The SHARED statement, as we noted earlier, makes the two variables X and Y common to GetMouseXY and the main program.

The next three statements (separated by colons) all call the function MOUSE( ). Depending on the value you enclose within the parentheses, the MOUSE function returns various information about what's happening with our little friend. There are seven possible values you can send the function, but the most important is the first. MOUSE(0) returns the state of the left button on the mouse.

Now, we wouldn't be here within GetMouseXY unless the user has pressed the left button. Remember, we notified AmigaBASIC we wanted to know when the left button was clicked when we initialized (On MOUSE GOSUB x:MOUSE ON). So, we don't need to check the value returned by MOUSE(0) and we assign its value to a dummy variable. This is enough for our purposes, but in some future program you may need to know more, and MOUSE(0) provides a slew of information. See page 8-85 of the AmigaBASIC manual for a description of other MOUSE(0) returns. MOUSE(1) and MOUSE(2) tell us the x,y coordinates of the mouse when the button was pressed. That's all Vectors! needs to know, so that's all we ask for.

We use the mouse as an event trapper in Vectors!, but the MOUSE( ) functions may be used anywhere in a program, even if the MOUSE ON statement isn't used. In this case, MOUSE(0) freezes the information in the other six function calls, allowing you to take the current x,y position of the mouse from MOUSE(1) and MOUSE(2), or any other information you need.

Only The Beginning

Vectors! only touches upon the exciting graphics power of the Amiga. We can do a lot more than draw lines, and you needn't be an expert in C or machine language to get at the Amiga toolbox. Certainly, native 68000 object code will be a magnitude quicker, but AmigaBASIC can be surprisingly powerful, quick and flexible. Vectors! serves to illustrate the possibilities and spark ideas for those who are itching to rev it up and go. ■

Vectors!

```
'                        VECTORS!
'          A graphics game/utility in AmigaBASIC
'
'Save this program without the comments if short of memory.
1 : CLEAR ,12000          'Allocate more memory for our screen
DEFINT a-z                '(leaving less array & program space)
memory&=FRE(-1)  'If you have a 512k machine and you'd like
arraysize=500    'to increase the arraysize, be sure to
IF memory& < 40000& THEN    'adjust the CLEAR appropriately
   ERROR 7
   END                   '--Not enough memory for Vectors!
ELSEIF memory& < 47000& THEN   '--Barely enough for 16
   depth=4                      '  colors
ELSE
   depth=5
END IF
SCREEN 1,320,200,depth,1
WINDOW 1,"VECTORS!  ------->  by Davis&Wilson",,2,1
    maxcolors=WINDOW(6)
    DIM a(arraysize), B(arraysize), c(arraysize)
    a(0)=900:B(0)=160:c(0)=100:cx=160:cy=100  'Init our
    CLS                                       'arrays
    f=0:pen=10   'f is our array pointer.pen tracks the
FOR i=0 TO 7:READ m$:MENU 1,i,1,m$:NEXT 'color selected
GOSUB InitColors  'read in all our rgb values.
                  'Delete if you want defaults
ON MENU GOSUB Choices:MENU ON           '--Enable Menu & Mouse
ON MOUSE GOSUB Mouser:MOUSE ON          '  event traps...
GOSUB InitScn     'Paint our 32 colored boxes & erase the
                  'canvas

zzz=-1        ' Vectors! does everything with the mouse & menu
WHILE zzz     '  --Everything is event (interrupt) driven
 SLEEP        ' so we put Basic to sleep (do nothing)
WEND

MainExit:   ' The Quit menu option will send us here,
            ' eventually
     ERASE a,B,c   '--frees the memory used by arrays
 ErrExit:          '--A debugging exit. Type GOTO ErrExit if
                   '  Vectors! appears to hang
ON ERROR GOTO 0  '--This sends all errors to AmigaBASIC.
MENU RESET:WINDOW CLOSE 1   '--Close our menu and our
                            '  window, free more memory
SCREEN CLOSE 1:WINDOW 1,,,15,-1   '--Close low res screen,
                                  '  reopen the BASIC window
        '--VERY IMPORTANT if you've closed the List window
END

'                          ---- Event Trappers ----
Choices: MenuItem=MENU(1)
  ON MenuItem GOTO RndC,Move,Play,Clean,ReMem,Disk,Quit
  RETURN

Mouser:  GetMouseXY
      IF MoveFlag THEN GOTO Mover
      IF Y < 11 THEN GOTO ColorChange
    WHILE MOUSE(0)<>0
      GetMouseXY
      IF RndFlag THEN pen=INT(RND*maxcolors)+1
      IF Y>=11 THEN GOSUB Draw0
    WEND
RETURN

'                           ---- Subprograms ----
SUB GetMouseXY STATIC
  SHARED X,Y
  idiot=MOUSE(0):X=MOUSE(1):Y=MOUSE(2)
END SUB

SUB rgb (reg,R,G,B) STATIC   'We prefer to think in terms of
  c!=1/15                    'whole numbers...  with this
  R!=c!*R:G!=c!*G:B!=c!*B    'subprogram we can say simply
  IF reg < 0 OR reg > WINDOW(6) THEN exitRGB  '--rgb 1,5,5,5
  PALETTE reg,R!,G!,B!     'instead of PALETTE 1,.33,.33,.33
exitRGB:
END SUB

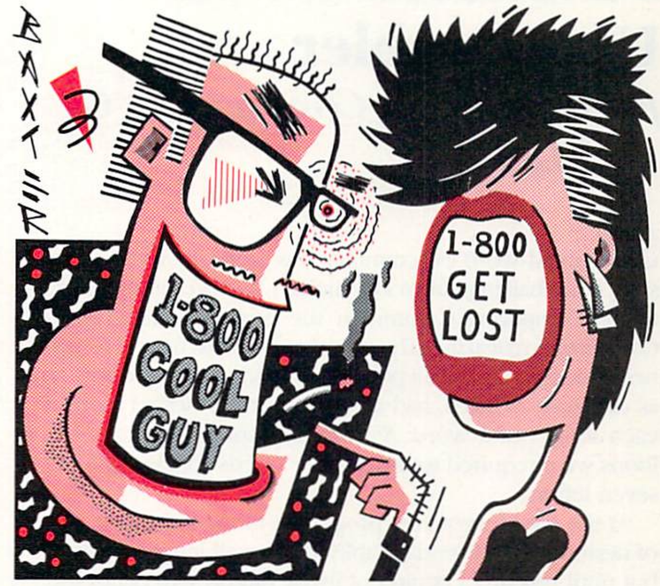
'                        -----  Initialization  -----
InitScn:    CLS
   FOR i=0 TO maxcolors                        'Paint our palette
     LINE(i*10,0)-(i*10+10,10),i,bf
```

Continued on pg. 127

BY JERRY A. STURDIVANT

Dial a Word

for the Commodore 128



You've seen those telephone numbers on television—ones like 1-800 GIVE ALL that you call to donate money. When you dial those letters, you are actually dialing 1-800 448-3255. (That's not a real number, I made it up). In this case, you could have just as easily have told you to dial 1-800 HIT FALL or 1-800 HIVE 255, which also stand for the same number. They took the letters that correspond to the numbers of the number and made a word out of it. Or they made a word and then bought that number from the phone company.

People will remember your number much easier if you give it to them as words. This program lets you do this. Enter and run this program, enter your seven-digit phone number and hit RETURN. It will show you all the possible letter combinations for your phone number. It takes about ten minutes to run (three minutes or less if one or more numbers is a one or a zero).

Or you might dump it to a printer. You do this by listing the program, then using the spacebar on the last program line to remove the 280 REM and hitting RETURN. This will add line 35 to the program. Move up and do the same on line 270 and 260. Now the program is ready for the printer.

If you have a one or a zero in your number, it will remain a number. In this case, make a a phrase, something like ALL FOR 1. Or if one letter doesn't fit, use its number, as in SEE 9 BEE, MIX BIG 8 or UB 4 GOT 2.

Be creative. You may also add letters to the end of your number if it helps make a word. Dialing an extra couple of numbers after the real number has been dialed usually won't matter.

When you run this program, you will get four words across. It may be easier to read the words as they scroll up single-column. To do that remove the comma in line 220.

The maximum number of possible word combinations will be three to the seventh power, or 2,187. If you have any ones or zeros, it will be less. If you wish to see what words the last four digits alone will make, just enter ones for the first three numbers. The combinations will fill the screen.

This program will not run on your 64 because of all the loops and math that fill the computer's STACK.

Program

The loop in lines 40 to 80 does two things. It makes each number of your phone number a variable applied to N(I). It also determines the size of the loops in lines 120 to 180. The telephone dial numbers 2 through 9 have three letters. Each three letters must be tried in combination with each of the other numbers letters. The number one and zero need only be tried once, since there are no letters with those numbers. Line 70 will make the loops only loop once.

The loop in line 90 to 110 splits up the telephone alphabet. Lines 120 to 180 set up the loops for the combinations. The first time through, the letters E through K will all be equal to one. This will make D$ in line 190 equal to 1111111. The next time through, D$ = 2111111. (Unless B(7) in line 18 equals one.) The last time through D$ would probably equal 3333333. The loop in line 220 will pick out the letters and print them to the screen. The first time through the loop W = 1.

In line 210, N(W) will be N(1) and will be the first number of your phone number, as fixed in line 50. Let's say your first number is a 3, N(1) = 3. So in line 210 L$(3) will be DEF (see lines 20 and 100) just like on your phone. Which of those letters we use is decided by the next portion of line 210, (MID$,D$,W + 1). D$ = "+1111111" (the + is because we turned a number into a string). W equals 1 so MID$(D$,2,1) takes the first one. So from DEF we will take D.

Line 220 says next W. N(W) will be your second number of your phone number. If D$ is "+1111111" then we will take the first letter of the three letters of that number. After seven letters are printed it will go back for the next combination. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Dial a Word

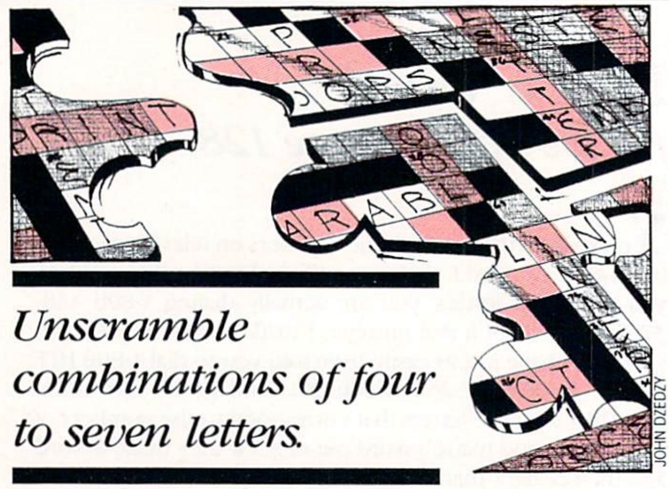
```
20 A$="ØØØ111ABCDEFGHIJKLMNOPRSTUVWXY
   "'BCOH
30 INPUT"PHONE NUMBER (7 DIGITS)";
   P$'BDEG
35 :'ABHE
40 FOR I=1 TO 7'DDKC
50 N(I)=VAL(MID$(P$,I,1))'DORG
60 B(I)=3'BFRD
70 IF N(I)<2 THEN B(I)=1'EKOH
```

Continued on pg. 98

BY E. STUART JOHNSON

Scrambled Words Unscrambler

for the VIC 20, Commodore 64 and 128



Unscramble combinations of four to seven letters.

Scrambled Word Unscrambler was originally written in answer to a challenge from Dr. Michael W. Ecker in his Recreational Computing Column in the now departed *Popular Computing* magazine. The program depends upon a series of nested loops to print all possible combinations of letters, and as originally written, had a separate set of nested loops for each length of a word. As a result, four different series of loops were required to unscramble words containing four to seven letters.

At the time I wrote the program, I thought that one series of nested loops should be able to solve all lengths of words, but until recently I could not figure out how to control it.

This new program uses one series of seven nested loops for words from four to seven letters in length. Most Scrambled Word puzzles published in the newspaper use two five-letter words and two six- letter words.

This program will work as is on the 128, but needs line 20 changed to use on both a 64 and VIC 20. Line 20 should read

20 POKE198,0:PRINT"[DOWN] Press any Key to Continue"
22 GET A$: if A$ = ""then 22
25 RETURN

Lines 30 through 60 request input of the scrambled word and establishes the length of the word in variable A. Line 70 sets up an array of A number of letters, and lines 90 through 370 contain seven nested loops (loops B,C,D,E,F,G and H). A four-letter word uses only four of the loops (loops B,C,D and E), while a seven-letter word uses all seven of the loops.

Note the seven NEXT commands in lines 310 through 370. Even though there are seven loops, we can select the starting loop and ignore the others. The IF A = 4 command in line 170 forces the computer to ignore lines 310 through 330 and use only the last four NEXTs. Similarly, line 210 controls the last five NEXTs, and line 260 the last six NEXTs. This system of selective loops allows us to use one series of loops for all lengths of words.

As an experiment, I extended the program to solve scrambled words up to 11 letters in length, even though any word longer than seven is impractical. A seven-letter word has 5,040 possible combinations, while an eight-letter one has over 50,000 and an 11-letter word has over 99 million!

Line 80 sets up the variable CT used to count the number of combinations printed to one screen. The screen of both the 64 and the 128 can hold up to 80 combinations of words. Line 300 delays the printing after 80 combinations of letters are printed until a key is pressed. If you have a VIC 20, substitute 20 for the 80 in line 300 and eliminate the comma in lines 160, 200, 250 and 300. Also add :CT = CT + 1 at the end of line 160. These changes can also be made for the 64 and 128 if you have difficulty reading four columns on a screen. ■

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

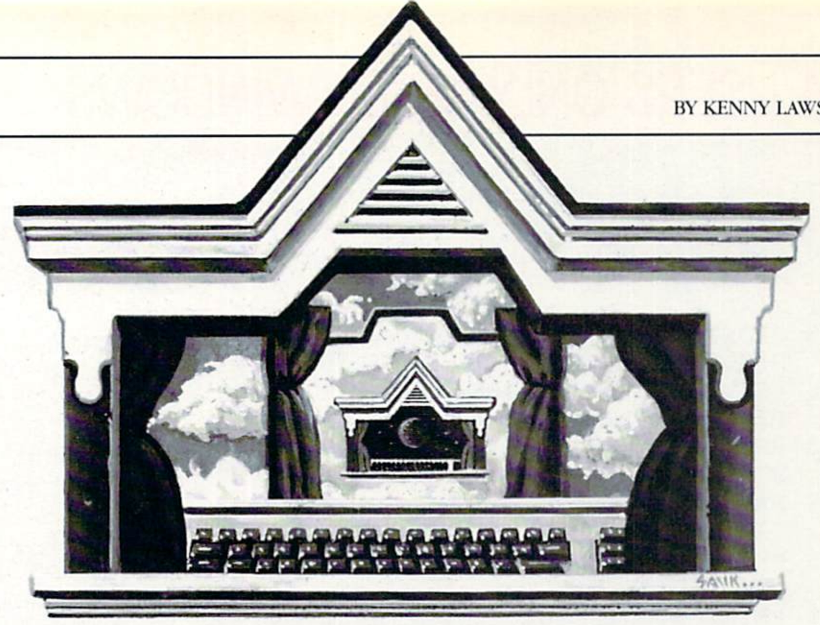
Scrambled Words Unscrambler

```
10 GOTO 30:DIM WD$(8)'CJSY
20 POKE 208,0:PRINT"[DOWN]
   PRESS ANY KEY TO CONTINUE[DOWN]"
   :GET KEY A$:RETURN'FKAK
30 PRINT"[CLEAR]ENTER SCRAMBLED WORD"
   :PRINT"NOT OVER 7 LETTERS"
   :INPUT W$'DEAM
40 A=LEN(W$)'CFEC
50 IF A>7 THEN PRINT"NOT OVER 7
   LETTERS, PLEASE":GOSUB 20
   :GOTO 30'GITN
60 IF A<4 THEN PRINT"ENTER AT LEAST 4
   [SPACE6]LETTERS,PLEASE":GOSUB 20
   :GOTO 30'GITQ
70 FOR X=1 TO A:WD$(X)=MID$(W$,X,1)
   :NEXT'GTOL
80 CT=.'BDSF
90 FOR B=1 TO A'DDNH
100 FOR C=1 TO A'DDOW
110 IF B-C=0 THEN 360'EGUY
120 FOR D=1 TO A'DDPY
130 IF(B-D)*(C-D)=0 THEN 350'GMRE
140 FOR E=1 TO A'DDQB
150 IF(B-E)*(C-E)*(D-E)=0 THEN
    340'IQRI
160 IF A=4 THEN PRINT WD$(B)WD$(C)WD$
    (D)WD$(E),'ECHJ
170 IF A=4 THEN 340'DFOE
180 FOR F=1 TO A'DDRF
190 IF(B-F)*(C-F)*(D-F)*(E-F)=0 THEN
    330'KUUO
200 IF A=5 THEN PRINT WD$(B)WD$(C)WD$
    (D)WD$(E)WD$(F),:CT=CT+1'GOII
```

Continued on pg. 128

BY KENNY LAWSON

Multiwindows
for the Commodore 64



ED SAUK

Create three windows on your screen.

Multiwindows is a program that relies heavily on machine-language subroutines called by SYS to create three windows on your screen, one on top of the other. These windows can contain options for doing any number of things. One window can contain an option to pop up another, or cancel the current window. Of course, the BASIC portion of the program can be customized to suit your own needs.

This program was developed one module at a time, saving each one with a different version number onto the same disk. This facilitates de-bugging and makes it easier to keep even line number increments. Then when all of the modules are ready, you can use a merge utility to bring all of the modules together into the finished program.

Line by Line Explanation

Lines 1-99 move down the top of BASIC memory by 12 pages to make room for some of the machine-language routines and screen saves and restores. Each SYS Sx and SYS Rx needs 1,000 bytes, so only two screens could fit into the 4K at $C000 (49152). The other screen is saved above the new top of memory, and this area also contains some of the machine-language routines. This module also defines most of the variables. You will still have about 28,600 BASIC bytes for your own programs.

Lines 100-199 set up the first screen of information, just as a demonstration. Lines 200-299 call a machine-language routine at 37888 to create the first window, then print more information onto the window. Lines 300-399 set up the second window and lines 400-499 set up the third window. All three windows use a different machine- language routine. The PRINT and IF-THEN statements are easily changed for your own applications.

Lines 500-599 let you just wait for a keypress, then RETURN with A$ to use for the option selected. Lines 600-699 are the ending routine, which clears the screen in a novel manner, using the Clear Screen Line routine at $E9FF (59903). This clears the screen vertically from left and right to center. Then we reset the memory pointers back to 40960, reset default colors and end.

Lines 1000-1051 are the machine-language routines which save or restore each screen. Multiwindows was originally written with one machine-language save and restore routines, then the new vectors were poked into the appropriate memory locations, but rewriting it this way proved to make a shorter, and faster program. The remainder of the program is machine-language code for creating and poking the menu windows onto the screen. If you know a little about machine language, you can easily change the DATA items to enlarge or shrink the windows, change their color, or move the windows to different places on-screen.

I used machine-language routines because they are faster than PRINT statements and also because they will save everything on the screen, including user INPUT, whereas PRINT cannot restore that data which is INPUT onto a screen.

Developing this program took a lot longer than anticipated, but it has given me a better understanding of machine language. As you can see, machine-language code can be quite lengthy, but the execution speed, among other advantages, is well worth the extra effort required. Once you start understanding machine language, it seems to get easier. ■

Before typing these programs, read "How to Enter Programs," and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Multiwindows

```
10 REM  *** MOVE MEMSIZ DOWN FOR ML
   AND SCREEN STORAGE ***'BQVI
15 :'ABHC
20 POKE 51,0:POKE 52,148:POKE 55,0
   :POKE 56,148:CLR'FYDF
25 :'ABHD
30 REM  *** SYS NUMBERS FOR ML
   ***'BVMF
35 :'ABHE
40 S1=828:R1=889:W1=37888:W2=38083
   :W3=38278'FKOL
42 S2=38473:R2=38534:S3=38595
   :R3=38656'EGEL
45 :'ABHF
50 REM      *** SET UP ML SUBROUTINES
   AND INITIALIZE ***'BMUL
55 :'ABHG
60 PRINT CHR$(147):POKE 214,9:PRINT
   :POKE 211,16:PRINT"POKING..."'GUTM
65 GOSUB 1000:GOSUB 1022:GOSUB 1042
   :GOSUB 1062:GOSUB 2060
   :GOSUB 3060'GEXQ
70 ZA=23:ZB=19:ZC=24:ZD=39
   :ZE=59903'FCEN
75 POKE 53280,6:POKE 53281,6
```

```
   :POKE 646,1:PRINT CHR$(147)'FCIQ
99 :'ABHO
100 REM  *** SET UP DEMO SCREEN
    ***'BVBB
101 :'ABHV
105 PRINT"[SPACE3]THIS IS A
    DEMONSTRATION OF HOW TO"'BAUJ
110 PRINT"USE THE 'MULTIWINDOWS'
    PROGRAM."'BATF
115 PRINT"WE ARE FILLING UP THE
    SCREEN WITH"'BAKK
120 PRINT"DIFFERENT THINGS,
     JUST TO SHOW YOU HOW"'BAEI
125 PRINT"YOU CAN EMULATE SOME OF THE
    MORE"'BASL
130 PRINT"SOPHISTICATED SOFTWARE ON
    THE MARKET BY"'BASJ
135 PRINT"OVERLAYING MENU WINDOWS
    ONTO THE SCREEN"'BAFO
140 PRINT"AND THEN RESTORING THAT
    SCREEN AFTER"'BAVJ
145 PRINT"MAKING A MENU SELECTION. OF
    COURSE, A"'BAAO
150 PRINT"[RVS]'PRINT'[RVOFF]
     STATEMENT COULD DO ALMOST
    THE"'BAWL
155 PRINT"SAME, UNLESS YOU ALSO HAVE
    USER INPUT"'BATP
160 PRINT"ON THE SCREEN. FOR AN
    EXAMPLE . . .":PRINT:PRINT
    :POKE 646,5'EINN
165 PRINT"WHAT'S YOUR CITY...";
    :POKE 646,7:INPUT NM$:PRINT
    :PRINT'FNUQ
170 POKE 646,1:PRINT"IN A NORMAL [RVS]
    'PRINT'[RVOFF] STATEMENT,
     THE USER"'CGFP
175 PRINT"NAME WOULD NOT BE RESTORED
    TO YOUR"'BARQ
180 PRINT"SCREEN, BUT 'MULTIWINDOWS'
    DOES IT ALL!";'BBYO
185 PRINT"[SPACE14,CMDR T12]":PRINT
    :PRINT'DCYT
190 PRINT"[SPACE4]PRESS ANY KEY TO
    START THE DEMO";'BBSN
195 GOSUB 500:SYS S1'CGAL
199 :'ABHN
200 REM  *** FIRST MENU OVERLAY
    ***'BWFC
201 :'ABHW
205 SYS W1:REM  *** CREATE OVERLAY
    ***'CWRH
210 POKE 214,1:PRINT:POKE 646,0
    :P1$="[RIGHT4]"'EQWD
215 PRINT P1$"[RVS]YOU CAN PUT ANY
    KIND":PRINT'CELJ
220 PRINT P1$"[RVS]OF INFORMATION
    OVER":PRINT'CENF
225 PRINT P1$"[RVS]THESE PAGES THAT
    YOU":PRINT'CEUK
230 PRINT P1$"[RVS]NEED FOR YOUR
    PROGRAM"'BDSG
235 POKE 214,10:PRINT:PRINT P1$"
    [WHITE]N[RVS,BLACK]EXT OR [RVOFF,
    WHITE]L[BLACK,RVS]AST? "'DLQN
240 GOSUB 500'BDIB
245 IF A$="N"THEN SYS S2:GOTO 300'FIRK
250 IF A$="L"THEN SYS R1:GOTO 195'FIZG
255 GOTO 240'BDFH
299 :'ABHO
300 REM  *** SECOND MENU OVERLAY
    ***'BXHD
301 :'ABHX
305 SYS W2:REM  *** CREATE OVERLAY
    ***'CWSI
310 POKE 214,5:PRINT:POKE 646,13
    :P2$="[RIGHT17,RVS]"'ERSF
315 PRINT P2$"[RVS]OF COURSE,
     YOU SHOULD":PRINT'CESK
320 PRINT P2$"[RVS]USE 'GET'
    STATEMENTS":PRINT'CECG
325 PRINT P2$"[RVS]TO CHECK FOR
    INPUT.":PRINT'CEHL
330 PRINT P2$"[RVS]NEXT WINDOW FOR
    SAMPLE":PRINT'CELI
335 PRINT P2$"[RVS]OF A USER'S MENU."
    :PRINT'CEGL
340 PRINT P2$"[RVS,WHITE]N[L. GREEN]
    EXT OR [WHITE]L[L. GREEN]
    AST? "'BDBH
345 GOSUB 500'BDIH
350 IF A$="N"THEN SYS S3:GOTO 400'FITH
355 IF A$="L"THEN SYS R2:GOTO 240'FIRM
360 GOTO 345'BDLE
399 :'ABHP
400 REM  *** THIRD MENU OVERLAY
    ***'BWRE
401 :'ABHY
405 SYS W3:REM  *** CREATE OVERLAY
    ***'CWTJ
410 POKE 214,10:POKE 646,12:PRINT
    :P3$="[RIGHT12]"'ESYG
415 PRINT P3$"[RVS]1. DISK[SPACE4]
    5. ADD"'BDKI
420 PRINT P3$"[RVS]2. TAPE[SPACE4]
    6. SUB."'BDKF
425 PRINT P3$"[RVS]3. PRINT[SPACE3]
    7. SAVE"'BDDK
430 PRINT P3$"[RVS]4. INPUT[SPACE3]
    7. LOAD"'BDRG
435 PRINT:PRINT:PRINT P3$"[RVS]
    MAKE YOUR SELECTION":PRINT'EGVP
440 PRINT:PRINT P3$"[RVS,WHITE]L
    [GRAY2]AST OR [WHITE]E[GRAY2]
    XIT PROGRAM?"'CEGL
445 GOSUB 500'BDII
450 IF A$="L"THEN SYS R3:GOTO 345'FIYI
455 IF A$="E"THEN 600: REM  ***
    ENDING ***'ESIO
460 GOTO 445'BDMF
499 :'ABHQ
500 REM  *** WAIT FOR KEYPRESS
    ***'BVDF
501 :'ABHA
505 GET A$:IF A$=""THEN 500'EIEI
```

```
510 RETURN'BAQA
599 :'ABHR
600 REM  *** CLEAR SCREEN VERTICALLY
    ***'BCBH
605 :'ABHF
610 FOR JJ=0 TO ZA:ZZ$=ZZ$+CHR$(32)
    +CHR$(157)+CHR$(17):NEXT
    :ZZ$=ZZ$+CHR$(145)'ONDT
615 FOR JJ=0 TO ZB:IF JJ=0 THEN POKE
    781,ZC:SYS ZE'ISSP
620 PRINT CHR$(19);TAB(JJ);ZZ$
    :PRINT CHR$(19);TAB(ZD-JJ);ZZ$
    :NEXT'IDIN
625 POKE 53280,14:POKE 53281,6
    :POKE 646,14:PRINT CHR$(147)
    :POKE 55,0:POKE 56,160'HQBT
630 CLR:POKE 51,0:POKE 52,160
    :POKE 55,0:POKE 56,160:CLR'GAYL
635 END'BACI
699 :'ABHS
1000 REM  *** ML SUBROUTINES FOR
     SAVING AND RESTORING SCREENS
     ***'BWQG
1001 :'ABHT
1002 FOR JJ=S1 TO S1+121:READ A
     :POKE JJ,A'GQHC
1003 NEXT:RETURN'CBXW
1004 DATA 162,0,189,0,4,157,0,192,189,
     0,5,157,0,193'BQDF
1005 DATA 189,0,6,157,0,194,189,0,216,
     157,0,196,189,0,217,157,0'BDXI
1006 DATA 197,189,0,218,157,0,198,202,
     208,217,162,231,189,0,7,157,
     0'BHPK
1007 DATA 195,189,0,219,157,0,199,202,
     224,255,208,239,96,162'BARK
1008 DATA 0,189,0,192,157,0,4,189,0,
     193,157,0,5,189,0,194,157'BBUL
1009 DATA 0,6,189,0,196,157,0,216,189,
     0,197,157,0,217,189,0,198'BDGM
1010 DATA 157,0,218,202,208,217,162,
     231,189,0,195,157,0,7,189,0,
     199'BHOF
1011 DATA 157,0,219,202,224,255,208,
     239,96'BHLB
1012 :'ABHV
1022 FOR JJ=S2 TO S2+121:READ A
     :POKE JJ,A'GQJE
1023 NEXT:RETURN'CBXY
1024 DATA 162,0,189,0,4,157,0,200,189,
     0,5,157,0,201'BQIH
1025 DATA 189,0,6,157,0,202,189,0,216,
     157,0,204,189,0,217,157,0'BDDK
1026 DATA 205,189,0,218,157,0,206,202,
     208,217,162,231,189,0,7,157,
     0'BHUM
1027 DATA 203,189,0,219,157,0,207,202,
     224,255,208,239,96,162'BAWM
1028 DATA 0,189,0,200,157,0,4,189,0,
     201,157,0,5,189,0,202,157'BBPN
1029 DATA 0,6,189,0,204,157,0,216,189,
     0,205,157,0,217,189,0,206'BDBO
1030 DATA 157,0,218,202,208,217,162,
     231,189,0,203,157,0,7,189,0,
     207'BHTH
1031 DATA 157,0,219,202,224,255,208,
     239,96'BHLD
1032 :'ABHX
1042 FOR JJ=S3 TO S3+121:READ A
     :POKE JJ,A'GQLG
1043 NEXT:RETURN'CBXB
1044 DATA 162,0,189,0,4,157,0,152,189,
     0,5,157,0,153'BQUJ
1045 DATA 189,0,6,157,0,154,189,0,216,
     157,0,156,189,0,217,157,0'BDPM
1046 DATA 157,189,0,218,157,0,158,202,
     208,217,162,231,189,0,7,157,
     0'BHHO
1047 DATA 155,189,0,219,157,0,159,202,
     224,255,208,239,96,162'BAJO
1048 DATA 0,189,0,152,157,0,4,189,0,
     153,157,0,5,189,0,154,157'BBIP
1049 DATA 0,6,189,0,156,157,0,216,189,
     0,157,157,0,217,189,0,158'BDTQ
1050 DATA 157,0,218,202,208,217,162,
     231,189,0,155,157,0,7,189,0,
     159'BHGJ
1051 DATA 157,0,219,202,224,255,208,
     239,96'BHLF
1060 :'ABHY
1061 REM  *** CREATE FIRST WINDOW
     ***'BXIG
```

```
1062 :'ABHB
1063 FOR X=W1 TO W1+194:READ A
     :POKE X,A'GOFJ
1064 NEXT:RETURN'CBXE
1065 DATA 160,0,162,0,169,160,157,42,
     4,152,157,42,216,232,224,25,208,
     242'BMEQ
1066 DATA 162,0,169,160,157,82,4,152,
     157,82,216,232,224,25,208,
     242'BGGQ
1067 DATA 162,0,169,160,157,122,4,152,
     157,122,216,232,224,25,208,
     242'BIRR
1068 DATA 162,0,169,160,157,162,4,152,
     157,162,216,232,224,25,208,
     242'BIAS
1069 DATA 162,0,169,160,157,202,4,152,
     157,202,216,232,224,25,208,
     242'BIPT
1070 DATA 162,0,169,160,157,242,4,152,
     157,242,216,232,224,25,208,
     242'BIXL
1071 DATA 162,0,169,160,157,26,5,152,
     157,26,217,232,224,25,208,
     242'BGEM
1072 DATA 162,0,169,160,157,66,5,152,
     157,66,217,232,224,25,208,
     242'BGMN
1073 DATA 162,0,169,160,157,106,5,152,
     157,106,217,232,224,25,208,
     242'BIXO
1074 DATA 162,0,169,160,157,146,5,152,
     157,146,217,232,224,25,208,
     242'BIGP
1075 DATA 162,0,169,160,157,186,5,152,
     157,186,217,232,224,25,208,
     242'BIOQ
1076 DATA 162,0,169,160,157,226,5,152,
     157,226,217,232,224,25,208,242,
     96'BLDS
2060 :'ABHA
2061 REM  *** CREATE SECOND WINDOW
     ***'BYKH
2062 :'ABHC
2063 FOR X=W2 TO W2+194:READ A
     :POKE X,A'GOHK
2064 NEXT:RETURN'CBXF
2065 DATA 160,13,162,0,169,160,157,
     215,4,152,157,215,216,232,224,25,
     208'BLKR
2066 DATA 242,162,0,169,160,157,255,4,
     152,157,255,216,232,224,25,208,
     242'BMVS
2067 DATA 162,0,169,160,157,39,5,152,
     157,39,217,232,224,25,208,
     242'BGMS
2068 DATA 162,0,169,160,157,79,5,152,
     157,79,217,232,224,25,208,
     242'BGUT
2069 DATA 162,0,169,160,157,119,5,152,
     157,119,217,232,224,25,208,
     242'BIGU
2070 DATA 162,0,169,160,157,159,5,152,
     157,159,217,232,224,25,208,
     242'BIOM
2071 DATA 162,0,169,160,157,199,5,152,
     157,199,217,232,224,25,208,
     242'BIWN
2072 DATA 162,0,169,160,157,239,5,152,
     157,239,217,232,224,25,208,
     242'BIMO
2073 DATA 162,0,169,160,157,23,6,152,
     157,23,218,232,224,25,208,
     242'BGAP
2074 DATA 162,0,169,160,157,63,6,152,
     157,63,218,232,224,25,208,
     242'BGIQ
2075 DATA 162,0,169,160,157,103,6,152,
     157,103,218,232,224,25,208,
     242'BITR
2076 DATA 162,0,169,160,157,143,6,152,
     157,143,218,232,224,25,208,242,
     96'BLBT
3060 :'ABHB
3061 REM  *** CREATE THIRD WINDOW
     ***'BXUI
3062 :'ABHD
3063 FOR X=W3 TO W3+194:READ A
     :POKE X,A'GOJL
3064 NEXT:RETURN'CBXG
3065 DATA 160,12,162,0,169,160,157,
     154,5,152,157,154,217,232,224,25,
     208'BLPS
3066 DATA 242,162,0,169,160,157,194,5,
     152,157,194,217,232,224,25,208,
     242'BMCT
3067 DATA 162,0,169,160,157,234,5,152,
     157,234,217,232,224,25,208,
     242'BICT
3068 DATA 162,0,169,160,157,18,6,152,
     157,18,218,232,224,25,208,
     242'BGIU
3069 DATA 162,0,169,160,157,58,6,152,
     157,58,218,232,224,25,208,
     242'BGQV
3070 DATA 162,0,169,160,157,98,6,152,
     157,98,218,232,224,25,208,
     242'BGYN
3071 DATA 162,0,169,160,157,138,6,152,
     157,138,218,232,224,25,208,
     242'BIKO
3072 DATA 162,0,169,160,157,178,6,152,
     157,178,218,232,224,25,208,
     242'BISP
3073 DATA 162,0,169,160,157,218,6,152,
     157,218,218,232,224,25,208,
     242'BIIQ
3074 DATA 162,0,169,160,157,2,7,152,
     157,2,219,232,224,25,208,242'BEGQ
3075 DATA 162,0,169,160,157,42,7,152,
     157,42,219,232,224,25,208,
     242'BGES
3076 DATA 162,0,169,160,157,82,7,152,
     157,82,219,232,224,25,208,242,
     96'BJRT
3099 :'ABHN
```

END

BY RUTH A. HICKS

A Child-Proof Cap
for the Commodore 64

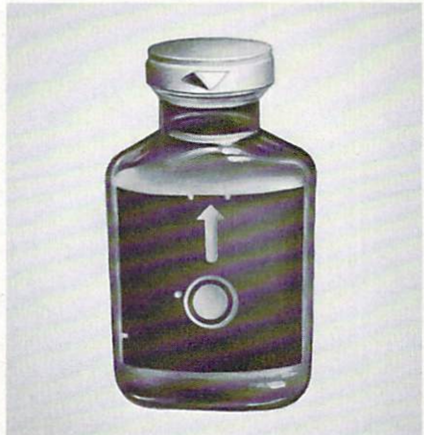
Disk Lock works the same as a child-proof cap on a bottle of medicine. Just as the cap keeps the child from tampering with the content of the medicine bottle, Disk Lock prevents tampering with the content of your programs. You can load, run and change your programs and re-save them with SAVE"Ø:program name",8 as usual.

Disk Lock also helps stop accidental loss or erasure. It allows you to lock and unlock individual programs or lock all the programs of an entire disk in as short of time as it takes to load the directory.

If you're like me and have several young children visitors and computer-illiterate friends wanting to try out all your programs, having your programs locked can save you worry about the loss of a favorite program.

After loading Disk Lock into your machine, run it and the program will direct you to insert the disk you wish to lock into the drive. Write-protect tabs must be removed from the disk since this program writes new codes for the program type. The computer program then asks if you wish to lock the entire disk or individual files.

To see the results of running Disk Lock, load the directory with LOAD"$",8. The program may boggle some of your computer buddies' minds, by the directory display on a locked disk. Normally when you display a disk's directory with LOAD"$",8 here is what you'll see.



Put a child-proof cap on your disk programs.

Ø	1541 TEST/DEMO	" ZX 2A
13	"HOW TO USE"	PRG
5	"HOW PART TWO"	PRG
4	"VIC-20 WEDGE"	PRG
1	"C-64 WEDGE	PRG
4	"DOS 5.1"	PRG
11	"COPY/ALL	PRG
9	"PRINTER TEST"	PRG
4	"DISK ADDR. CHANGE"	PRG
4	"DIR"	PRG
6	"VIEW BAM"	PRG
4	"CHECK DISK"	PRG
14	"DISPLAY T&S"	PRG

On the left side of the display is the number of sectors each program occupies on the disk for each program. In the center of the display is each program's name and to the right is an abbreviation for the type of program it is. The four common types are PRG for program, SEQ for a sequential file, REL for a relative file, and the least common, USR for user files. After running Disk Lock to lock your programs, you will notice upon loading the directory that now the program types of all locked files have a wedge or greater than symbol after the file type.

0	"1541 TEST/DEMO	" ZX 2A
13	"HOW TO USE"	PRG<
5	"HOW PART TWO"	PRG<
4	"VIC-20 WEDGE"	PRG<
1	"C-64 WEDGE"	PRG<
4	"DOS 5.1"	PRG<
11	"COPY-ALL	PRG<
9	"PRINTER TEST"	PRG<
4	"DISK ADDR. CHANGE"	PRG<
4	"DIR"	PRG<
6	"VIEW BAM"	PRG<
4	"CHECK DISK"	PRG<
14	"DISPLAY T&S"	PRG<

Locking a program or disk is actually a built-in feature of the Commodore machines, but for some reason Commodore failed to implement it into a BASIC command we could all use. Consequently, in order to lock a program a complex sequence of steps must be taken, bits read, compared and re-written to disk. Fortunately, you don't need to understand every phase to use the program, but if you are interested and learning about DOS (disk operating system) commands, this is an excellent program to study.

Remember that locking a program is not a sure cure for all possible problems, but it will help to avoid those accidental losses. If at any time you wish to unlock a single program, all you need to do is to use the resave command, SAVE"@Ø:Program Name",8.

Warning

Do not try to lock a program which has an asterisk next to the file (*PRG). The asterisk signifies the program was never closed properly. You must correct this error condition before the file can be locked. ■

Before typing these programs, read "How to Enter Programs," and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Disk Lock

```
20 POKE 53280,6:POKE 53281,0
   :PRINT"[CLEAR,WHITE]":CLR'ERIE
30 FOR I=0 TO 4:READ F$(I):NEXT'FKFE
40 DATA DEL,SEQ,PRG,USR,REL'BTHF
50 FOR I=0 TO 4:READ L$(I):NEXT'FKLG
60 DATA DEL<,SEQ<,PRG<,USR<,REL<'BYBI
70 T=18:S=1'CGWF
80 PRINT:PRINT:PRINT:PRINT"[SPACE3]
```

64 USERS ONLY/A CHILD-PROOF CAP

```
   PLACE DESIRED DISK INTO DRIVE"'EDDE
90 PRINT:PRINT:PRINT"[SPACE2]
   LOCK ENTIRE [RVS]D[RVOFF]
   ISK OR INDIVIDUAL [RVS]F[RVOFF]
   ILES"'DCJS
100 PRINT:PRINT:PRINT TAB(18)"[RVS]D
    [RVOFF] OR [RVS]F[RVOFF]";
    :INPUT Q$'FJFC
110 IF Q$<>"D" AND Q$<>"F"THEN 90'HGKC
120 PRINT"[CLEAR]":PRINT TAB(4)"[RVS]
     # ";TAB(8)" DIRECTORY NAME ";
    TAB(27)" FILE [RVOFF]"'FKTJ
125 PRINT'BACC
130 OPEN 15,8,15'BHAY
140 PRINT#15,"I0"'BDOA
150 INPUT#15,EN,EM$,ET,ES'BPUE
160 IF EN<>0 THEN PRINT"[SPACE6]
    DOS ERROR":GOTO 1050'GIKJ
170 OPEN 7,8,7,"#0"'BGEE
180 PRINT#15,"U1"7;0;T;S'BKMG
190 INPUT#15,EN,EM$,ET,ES'BPUI
200 IF EN<>0 THEN PRINT"[SPACE6]
    DOS ERROR":GOTO 1000'GIFE
210 PRINT#15,"M-R";CHR$(0);CHR$(3);
    CHR$(255)'ERPD
220 BT=T:BS=S'CHLB
230 PRINT#15,"B-P";7;0'BHAB
240 GET#7,T$'BFIB
250 IF T$="" THEN T$=CHR$(0)'FHFF
260 GET#7,S$'BFHD
270 IF S$="" THEN S$=CHR$(0)'FHDH
280 T=ASC(T$):S=ASC(S$)'ELWJ
300 FOR I=0 TO 7'DDJY
310 PRINT#15,"B-P";7;2+B'CIHB
320 GET#7,B$'BFPA
330 FOR J=0 TO 4'DDHC
340 IF B$=CHR$(128+J) THEN B$=F$(J)
    :J=4'HSTJ
350 IF B$=CHR$(192+J) THEN B$=L$(J)
    :J=4'HSBK
360 NEXT J'BBDD
500 PRINT#15,"B-P";7;5+B'CIKC
510 FOR K=0 TO 15'DEIC
520 GET#7,C$'BFQC
530 IF C$="" THEN C$=CHR$(0)'FHVG
540 C=ASC(C$)'CFOF
550 IF C$=CHR$(0) THEN E=E+1'GITJ
560 IF C>31 AND C<91 THEN
    CC$=CC$+C$'HOAM
570 IF E=16 AND T=0 THEN K=15
    :GOTO 990'HMKN
580 NEXT K'BBEH
590 CT=CT+1'CFLK
800 PRINT TAB(4)CT;TAB(8)CC$;TAB(28)B$
    :CC$=CHR$(0):E=0:D$=B$
    :B$=CHR$(0)'KMFQ
810 IF Q$="F" THEN GOSUB 2000'EGNG
820 IF Q$="D" THEN GOSUB 2030'EGOH
830 B=B+32'CESH
840 NEXT I'BBCG
850 IF T<>0 THEN B=0:GOTO 180'GIDM
990 IF Q$="D" THEN Q$=CHR$(0):B=0:T=BT
    :S=BS:GOTO 180'JWMX
1000 CLOSE 7'BBOS
1010 INPUT#15,EN,EM$,ET,ES'BPUX
1050 CLOSE 15'BCGY
1060 IF EN<>0 THEN PRINT:PRINT
     :PRINT EN,EM$,ET,ES'HRYH
1070 END'BACA
2000 PRINT TAB(10)" CHANGE THIS FILE?
     N[LEFT3]";:INPUT A$'DHAE
2010 IF LEFT$(A$,1)<>"Y" THEN
     RETURN'GGNA
2030 FOR J=0 TO 4'DDHY
2040 IF D$=F$(J) THEN D$=CHR$(192+J)
     :J=4'HSYG
2050 IF D$=L$(J) THEN D$=CHR$(128+J)
     :J=4'HSEH
2060 NEXT J'BBDA
2070 PRINT#15,"B-P";7;2+B'CIHE
2080 PRINT#7,D$;'BFHD
2090 PRINT#15,"U2"7;0;BT;BS'BMUG
3000 IF EN<>00 THEN PRINT
     :PRINT"[SPACE2]DISK[SPACE2]
     ERROR"EN,EM$,ET,ES:GOTO 1000'HWFH
3010 PRINT#15,"B-P";7;5+B'CIKY
3020 RETURN'BAQW
```

END

JIFFIES/DIAL A WORD

Continued from pg. 91

```
80 NEXT'BAEE
85 :'ABHJ
90 FOR I=1 TO 10'DECH
100 L$(I-1)=MID$(A$,I*3-2,3)'FQRB
110 NEXT'BAEV
115 :'ABHB
120 FOR K=1 TO B(1)'DGXA
130 FOR J=1 TO B(2)'DGXB
140 FOR I=1 TO B(3)'DGXC
150 FOR H=1 TO B(4)'DGXD
160 FOR G=1 TO B(5)'DGXE
170 FOR F=1 TO B(6)'DGXF
180 FOR E=1 TO B(7)'DGXG
190 D$=STR$(E+F*10+G*100+H*1000+I*100
    00+J*100000+K*1000000)'ONOV
195 :'ABHJ
200 FOR W=1 TO 7'DDYX
210 PRINT MID$(L$(N(W)),VAL(MID$(D$,
    W+1,1)),1);'FAFF
220 NEXT W:PRINT,'CDPY
225 :'ABHD
230 NEXT E,F,G,H,I,J,K'BNEC
240 END'BACA
250 REM---------------------------'
    BERG
260 REM   35 CLOSE4:OPEN4,4:CMD4'BVBH
270 REM   220 NEXT W:PRINT" ";'BPSH
280 REM   240 PRINT#4:CLOSE4:END'BVDJ
```

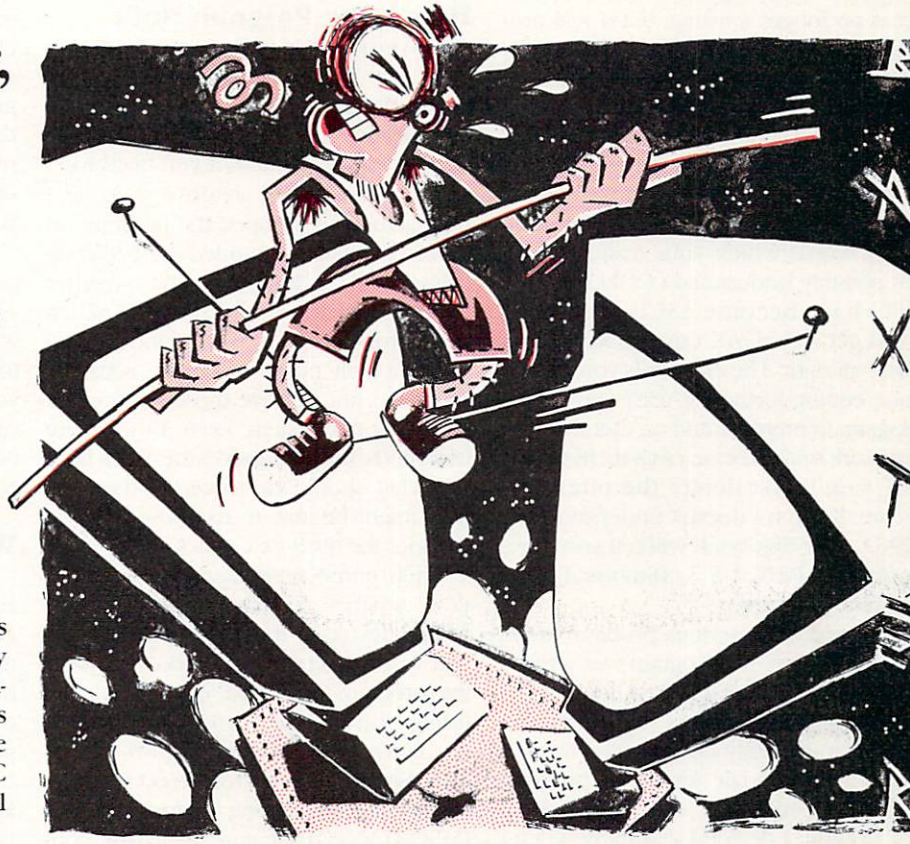
END

BY ELIZABETH DEAL

Universal Program Lister,

Part 2
For the Commodore 128

In Part 1, the history of Commodore BASIC revealed why BASIC programs on one Commodore computer may not list correctly on another. Part 2 features a universal listing routine to bridge the gap between computers.



ART BAXTER

A listing program must list everyone's keywords correctly. It should preferably have spaces to make it a bit more readable (in my program the space insertion is optional). The computer in which the listing is being done has to process BASIC tokenized text as if the keywords from all the machines were in your computer.

I chose to write the listing routine itself in machine code to make it nice and fast. I transferred BASIC keywords from all Commodore computers, created a large continuous table, and my listing routine now uses that table instead of the one that is in the host computer.

A listing routine must list the entire text correctly. This is a small problem, as the Commodore computers have different sizes of the BASIC Input Buffer (where you normally enter your BASIC text). All computers can handle lines of 80-88 characters, but the B128/256 and 128 machines have the buffer size of 160 bytes. No problem in listings. Everything will list, no matter how long a BASIC line is, up to 255 bytes.

However, there will be error messages displayed throughout your listing and at the end of a line if text exceeds the BASIC Input Buffer size in your computer. I cannot split the lines for you. What if the program were numbered 1,2,3,4—I can't make line 3.5. I tried it. It won't work. Also splitting the lines would require understanding the program logic—what do we do after IF? I felt there is no point going that far.

A listing routine should understand any program from any computer. It should warn you if there are translation problems. In my program you don't have to tell it where the program came from. The computer will try to learn from what it sees and tell you what the source computer might have been.

WARNING: there is no earthly way in which the computer can tell a difference between the PET versus Plus/4 paths of keywords in the $CF to $FE columns. So the default will be "source B128" if those keywords are present. You can look over the screen or paper, and if you think the source might be Plus/4/C128, rerun the listing again, this time telling your computer that the source is Plus/4/C128.

My program is fast, so you're unlikely to lose much time. The ending message suggests the source computer type. Use your head. Don't trust the computer.

Ironically, the disk version of my LIST/CONV program can never list correctly. It is an odd program: it was created on both the B-machine and 128. Depending what you tell your computer the source is, you'll get two kinds of listings.

The output should be flexible, it must go to any device. It must be a standard sequential file that other programs can process. My listing routine can print ASCII listings on the screen, printer or disk. If you read the BASIC part of my listing routine, you'll see those alternatives coded in the user-friendly PRINT and INPUT statements.

I normally do a first listing on the screen, using the P key to pause and read what I'm faced with. Any key or P again restarts and listing. I can see the lines go by and can make mental notes of what the program contains. When I see that the computer is switching the source type number, I can push Q to quit and start all over. The STOP key doesn't work. The report at the end appears only on the screen. It tells the (suggested) source type and if there were line length errors. If there were no translation type errors, you're home free!

Creating Programs by Crunching Keywords

Once you have a readable listing, you can hand-edit the foreign program to suit your machine. But I decided to go one

step further. My listing routine can create programs from programs. The end product is no longer a listing, but a real program that can be loaded. Will it run in your machine? That depends.

Subject to everything I wrote so far, a program will run in your machine, as by now the ASCII words such as APPEND have been tokenized into a token corresponding to your machine. By the same token, words which your machine cannot possibly understand (COLOR in the PET) have become ASCII strings. So you'll get a SYNTAX error at RUN time. That's all right. The error tells you to continue editing further; at least you have a program in memory and on disk that you can work with. In case of COLOR on the PET, you'll just delete the offending theme. If the 64 doesn't understand APPEND, your disk book will tell you to recode as OPEN 1,8,3,"0:name,a" and you're in business.

Where a fairly serious problem arises is in line length. If a program was written on a B128 or 128 using text lines longer than, say, 88 characters, my crunching routine mercilessly chops those lines. It would require a fair amount of program intelligence to handle that issue. I chose not to do it. I decided that by now a 64 user, perhaps, has a listing showing clearly the lines which are too long. All the user has to do is enter the remaining information into his program. The user has to watch the line numbers, of course, as well as the IF-THEN-ELSE program logic. You wouldn't trust a dumb hunk of wires to do the thinking for you, would you? Not me.

How is the Program Built

The program is really made up of two parts. The first part is pure BASIC. It is a loader program. It needs to load further code using drive 0, device 8. You may change that assignment if you need to.

There are several sensitive spots, as I have actually developed the program on a B128 machine and added the 128 code using a 128 machine. If you have neither of those machines, don't worry. When BASIC runs in a non-B or a non-C computer, it will never reach the sensitive spots. Do not remove those lines, other guys may need them. Even if they were mistyped (mistokenized) the REM lines tell what should be there, so the next user might be able to fix those lines on the spot for his B or C machine.

Then come several questions about your wishes: source program name, which device is it on, which drive, do you want spaces inserted, do you want the program crunched, do you want a listing, and if so to what device, and so on. Enter crazy values to abort inputs. You also get a chance to correct your answers before the listing begins.

IMPORTANT: make sure your disk contains no asterisk files (unclosed) and that it has room for program listings. Listings are always longer than PRG files. Crunched programs are about the same length.

The second part is pure machine code. Once the files are all set up in BASIC, machine code does the rest. This section contains all the keywords CBM ever put out. They are in a table that my routine understands. This means—do not change a thing. This section of the lister comes from one common assembly program. It was assembled using PAL's conditional assembly feature to run on all the machines. The starting address of the machine code section differs from one computer to another.

A special note to the B-machine people: you must have extra memory at $5000 in Bank 15 for this to run, otherwise the program just stops and refuses to go on. If you have my KEYTRIX utility, you already have a listing routine which can handle all computers except 128, so you're in a better shape than anybody else.

Where Can You Get It?

While BASIC could be typed in fairly easily from this magazine, the machine code section is fairly tedious, even though it's short (5 blocks of code plus 4 blocks of keywords). The trouble is that there are six versions of machine code portion which run in the PET 2, PET 4, C64 (and maybe VIC), B128, Plus/4, C16 and C128. It would be a nightmare of confusion to publish all versions. Users would be unlikely to type in the versions which aren't coded for their machine, hence, they would have an incomplete set. So, instead, I am running the 128 version and if you would like another version, please write to me in care of the magazine and we can make arrangements from there. ■

Before typing these programs, read "How to Enter Programs," and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Keylist Maker

```
10 OPEN 5,8,5,"+C128 KLST V4,P,W"'BGCC
20 PRINT#5,CHR$(0);:PRINT#5,CHR$(48);
   'EOJD
30 READ A$:IF A$="END"THEN CLOSE 5
   :GOTO 100'GKNF
40 B=DEC(A$):PRINT#5,CHR$(B);
   :T=T+B'GQTH
50 GOTO 30'BCKB
100 IF T<>246756 THEN PRINT"ERROR IN
    DATA - CHECK DATA STATEMENTS"
    :END'GIPK
110 PRINT"DONE"'BATW
1000 DATA 4P,4E,C4,46,4F,D2,4E,45,58,
     D4,44,41,54,C1,49,4E'BWJD
1001 DATA 50,55,54,A3,49,4E,50,55,D4,
     44,49,CD,52,45,41,C4'BWWD
1002 DATA 4C,45,D4,47,4F,54,CF,52,55,
     CE,49,C6,52,45,53,54'BWMF
1003 DATA 4F,52,C5,47,4F,53,55,C2,52,
     45,54,55,52,CE,52,45'BWDF
1004 DATA CD,53,54,4F,D0,4F,CE,57,41,
     49,D4,4C,4F,41,C4,53'BWXH
1005 DATA 41,56,C5,56,45,52,49,46,D9,
     44,45,C6,50,4F,4B,C5'BWFI
1006 DATA 50,52,49,4E,54,A3,50,52,49,
     4E,D4,43,4F,4E,D4,4C'BWZJ
1007 DATA 49,53,D4,43,4C,D2,43,4D,C4,
     53,59,D3,4F,50,45,CE'BWRK
1008 DATA 43,4C,4F,53,C5,47,45,D4,4E,
     45,D7,54,41,42,A8,54'BWOL
1009 DATA CF,46,CE,53,50,43,A8,54,48,
     45,CE,4E,4F,D4,53,54'BWOM
1010 DATA 45,D0,AB,AD,AA,AF,DE,41,4E,
     C4,4F,D2,BE,BD,BC,53'BWEE
1011 DATA 47,CE,49,4E,D4,41,42,D3,55,
     53,D2,46,52,C5,50,4F'BWAF
```

```
1012 DATA D3,53,51,D2,52,4E,C4,4C,4F,
     C7,45,58,D0,43,4F,D3'BWDG
1013 DATA 53,49,CE,54,41,CE,41,54,CE,
     50,45,45,CB,4C,45,CE'BWRH
1014 DATA 53,54,52,A4,56,41,CC,41,53,
     C3,43,48,52,A4,4C,45'BWKH
1015 DATA 46,54,A4,52,49,47,48,54,A4,
     4D,49,44,A4,00,47,CF'BWDI
1016 DATA 00,43,4F,4E,43,41,D4,44,4F,
     50,45,CE,00,44,43,4C'BWRJ
1017 DATA 4F,53,C5,00,52,45,43,4F,52,
     C4,48,45,41,44,45,D2'BWYK
1018 DATA 43,4F,4C,4C,45,43,D4,42,41,
     43,4B,55,D0,43,4F,50'BWYL
1019 DATA D9,41,50,50,45,4E,C4,44,53,
     41,56,C5,44,4C,4F,41'BWQM
1020 DATA C4,43,41,54,41,4C,4F,C7,52,
     45,4E,41,4D,C5,53,43'BWAF
1021 DATA 52,41,54,43,C8,44,49,52,45,
     43,54,4F,52,D9,00,44'BWAF
1022 DATA 43,4C,45,41,D2,42,41,4E,CB,
     42,4C,4F,41,C4,42,53'BWDH
1023 DATA 41,56,C5,4B,45,D9,44,45,4C,
     45,54,C5,45,4C,53,C5'BWNI
1024 DATA 54,52,41,D0,52,45,53,55,4D,
     C5,44,49,53,50,4F,53'BWNI
1025 DATA C5,50,55,44,45,C6,55,53,49,
     4E,C7,45,52,52,A4,49'BWRJ
1026 DATA 4E,53,54,D2,00,52,47,D2,52,
     43,4C,D2,00,52,4C,55'BWAK
1027 DATA CD,00,4A,4F,D9,52,44,4F,D4,
     44,45,C3,48,45,58,A4'BWPM
1028 DATA 45,52,52,A4,49,4E,53,54,D2,
     45,4C,53,C5,52,45,53'BWGM
1029 DATA 55,4D,C5,54,52,41,D0,54,52,
     4F,CE,54,52,4F,46,C6'BWZO
1030 DATA 53,4F,55,4E,C4,00,56,4F,CC,
     41,55,54,CF,50,55,44'BWWG
1031 DATA 45,C6,47,52,41,50,48,49,C3,
     50,41,49,4E,D4,43,48'BWWG
1032 DATA 41,D2,42,4F,D8,43,49,52,43,
     4C,C5,47,53,48,41,50'BWGH
1033 DATA C5,53,53,48,41,50,C5,44,52,
     41,D7,4C,4F,43,41,54'BWAI
1034 DATA C5,43,4F,4C,4F,D2,53,43,4E,
     43,4C,D2,00,53,43,41'BWHK
1035 DATA 4C,C5,48,45,4C,D0,44,CF,4C,
     4F,4F,D0,45,58,49,D4'BWFL
1036 DATA 44,49,52,45,43,54,4F,52,D9,
     44,53,41,56,C5,44,4C'BWYL
1037 DATA 4F,41,C4,48,45,41,44,45,D2,
     53,43,52,41,54,43,C8'BWLM
1038 DATA 43,4F,4C,4C,45,43,D4,43,4F,
     50,D9,52,45,4E,41,4D'BWXO
1039 DATA C5,42,41,43,4B,55,D0,44,45,
     4C,45,54,C5,52,45,4E'BWOO
1040 DATA 55,4D,42,45,D2,4B,45,D9,4D,
     4F,4E,49,54,4F,D2,55'BWCH
1041 DATA 53,49,4E,C7,55,4E,54,49,CC,
     57,48,49,4C,C5,00,A0'BWJI
1042 DATA A0,50,4F,D4,42,55,4D,D0,50,
     45,CE,52,53,50,50,4F'BWEJ
1043 DATA D3,52,53,50,52,49,54,C5,52,
     53,50,43,4F,4C,4F,D2'BWRJ
1044 DATA 58,4F,D2,52,57,49,4E,44,4F,
     D7,50,4F,49,4E,54,45'BWHL
1045 DATA D2,00,A0,A0,42,41,4E,CB,46,
     49,4C,54,45,D2,50,4C'BWKM
1046 DATA 41,D9,54,45,4D,50,CF,4D,4F,
     56,53,50,D2,53,50,52'BWFN
1047 DATA 49,54,C5,53,50,52,43,4F,4C,
     4F,D2,52,52,45,C7,45'BWAN
1048 DATA 4E,56,45,4C,4F,50,C5,53,4C,
     45,45,D0,43,41,54,41'BWPO
1049 DATA 4C,4F,C7,44,4F,50,45,CE,41,
     50,50,45,4E,C4,44,43'BWRQ
1050 DATA 4C,4F,53,C5,42,53,41,56,C5,
     42,4C,4F,41,C4,52,45'BWBI
1051 DATA 43,4F,52,C4,43,4F,4E,43,41,
     D4,44,56,45,52,49,46'BWMI
1052 DATA D9,44,43,4C,45,41,D2,53,50,
     52,53,41,D6,43,4F,4C'BWPJ
1053 DATA 4C,49,53,49,4F,CE,42,45,47,
     49,CE,42,45,4E,C4,57'BWSL
1054 DATA 49,4E,44,4F,D7,42,4F,4F,D4,
     57,49,44,54,C8,53,50'BWEM
1055 DATA 52,44,45,C6,51,55,49,D4,53,
     54,41,53,C8,A0,46,45'BWRM
1056 DATA 54,43,C8,A0,53,57,41,D0,4F,
     46,C6,46,41,53,D4,53'BWSN
1057 DATA 4C,4F,D7,00,4B,45,D9,43,4F,
     4C,4F,D2,47,52,41,50'BWJP
1058 DATA 48,49,C3,53,43,4E,43,4C,D2,
     4C,4F,43,41,54,C5,53'BWIQ
1059 DATA 43,41,4C,C5,42,4F,D8,43,49,
     52,43,4C,C5,43,48,41'BWVQ
1060 DATA D2,44,52,41,D7,47,53,48,41,
     50,C5,50,41,49,4E,D4'BWDI
1061 DATA 53,53,48,41,50,C5,54,55,4E,
     C5,46,49,4C,54,45,D2'BWNJ
1062 DATA 53,50,52,44,45,C6,54,45,4D,
     50,CF,4D,4F,56,53,50'BWVK
1063 DATA D2,53,50,52,43,4F,CC,53,50,
     52,49,54,C5,43,4F,4C'BWCM
1064 DATA 49,4E,D4,53,50,52,53,41,D6,
     52,42,55,4D,D0,52,43'BWYM
1065 DATA 4C,D2,52,44,4F,D4,52,47,D2,
     52,4A,4F,D9,52,50,45'BWVO
1066 DATA CE,52,50,4F,D4,52,53,50,43,
     4F,CC,52,53,50,50,4F'BWLP
1067 DATA D3,52,53,50,D2,00,4E,4F,4D,
     4F,52,45,AA,AA,AA,AA'BWJQ
1068 DATA 4C,69,35,4C,6C,35,00,00,08,
     03,08,00,01,02,03,FC'BWPQ
1069 DATA 01,A4,00,00,00,00,00,00,00,
     00,00,00,00,00,00,00'BWTR
1070 DATA 00,21,42,41,44,20,4C,45,4E,
     47,54,C8,21,44,45,43'BWCJ
1071 DATA 4F,44,45,20,45,52,52,4F,D2,
     0D,21,21,21,20,45,52'BWKK
1072 DATA 52,4F,52,53,8D,21,53,4F,55,
     52,43,45,20,4D,49,47'BWSL
1073 DATA 48,54,20,42,45,A0,30,3D,50,
     45,54,31,20,31,3D,50'BWOM
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1074 DATA 45,54,32,2F,56,2F,43,36,34,
     20,32,3D,43,36,34,2B'BWAN
1075 DATA 45,58,50,0D,33,3D,50,45,54,
     34,20,34,3D,42,31,32'BWAO
1076 DATA 38,2F,32,35,36,0D,35,3D,2B,
     34,2F,43,31,36,20,20'BWFP
1077 DATA 36,3D,43,31,32,38,8D,61,34,
     6C,34,79,34,85,34,96'BWNQ
1078 DATA 34,BA,39,80,CB,CC,CE,CF,DB,
     E9,FE,00,30,00,00,00'BWXS
1079 DATA 00,00,00,00,00,00,00,00,00,
     00,00,00,30,FE,30,00'BWVS
1080 DATA 00,00,00,00,00,00,00,00,00,
     00,00,00,30,FE,30,00'BWVK
1081 DATA 00,00,00,00,00,00,00,00,00,
     94,33,00,30,FE,30,01'BWQL
1082 DATA 31,0D,31,14,31,00,00,00,00,
     00,00,00,30,FE,30,01'BWJM
1083 DATA 31,0D,31,14,31,5F,31,00,00,
     00,00,00,30,FE,30,A5'BWLN
1084 DATA 31,AD,31,B2,31,E6,31,2D,32,
     00,00,00,30,FE,30,A5'BWUO
1085 DATA 31,9F,32,B2,31,E6,31,2D,32,
     D2,32,EB,34,FB,34,0B'BWBQ
1086 DATA 35,1B,35,2B,35,3B,35,4B,35,
     A2,80,2C,A2,00,8E,5F'BWMR
1087 DATA 34,A9,00,8D,4B,34,8D,53,34,
     AD,46,34,8D,52,34,A5'BWSS
1088 DATA 3D,48,A5,3E,48,20,E5,36,AD,
     53,34,F0,03,4C,07,36'BWNT
1089 DATA 20,E5,36,A9,00,8D,60,34,20,
     E5,36,8D,59,34,AD,53'BWCU
1090 DATA 34,F0,03,4C,07,36,20,E5,36,
     0D,59,34,F0,59,20,E5'BWKL
1091 DATA 36,85,16,20,E5,36,85,17,AC,
     53,34,D0,4A,20,4B,37'BWKM
1092 DATA 2C,5F,34,30,03,20,65,37,20,
     26,37,D0,3A,A9,20,20'BWVN
1093 DATA FE,36,A9,04,8D,5D,34,20,C7,
     37,AD,53,34,D0,28,2C'BWYP
1094 DATA 5F,34,30,03,20,78,37,2C,60,
     34,08,10,08,20,6F,39'BWHP
1095 DATA A2,00,20,73,36,28,50,05,A2,
     01,20,73,36,AD,53,34'BWAQ
1096 DATA D0,05,20,D0,36,D0,8C,20,89,
     36,2C,5F,34,30,03,20'BWQR
1097 DATA AE,37,20,CC,FF,A9,01,8D,55,
     34,38,20,C3,FF,EE,55'BWBT
1098 DATA 34,AD,55,34,C9,07,90,F2,EA,
     EA,EA,EA,EA,58,20,E4'BWAU
1099 DATA FF,C9,00,D0,F9,2C,4B,34,10,
     05,A2,02,20,53,36,20'BWSU
1100 DATA 76,36,A2,04,20,53,36,A2,05,
     20,53,36,68,85,3E,68'BWTD
1101 DATA 85,3D,60,8A,0A,AA,BD,D7,34,
     85,FE,BD,D8,34,85,FF'BWRF
1102 DATA 20,45,37,A0,00,B1,FE,08,29,
     7F,20,FE,36,C8,28,10'BWHG
1103 DATA F4,58,60,20,53,36,A2,03,20,
     53,36,AD,52,34,09,30'BWPG
1104 DATA 20,FE,36,A9,0D,20,FE,36,60,
     A2,00,20,B3,36,AD,49'BWCI
1105 DATA 34,C9,08,90,03,20,B9,36,AD,
     4A,34,CD,49,34,F0,08'BWOJ
1106 DATA 2C,5F,34,30,03,20,B9,36,AD,
     48,34,CD,49,34,F0,03'BWGK
1107 DATA 20,B9,36,A9,8D,9D,BA,39,60,
     20,B4,FF,A9,6F,20,96'BWEL
1108 DATA FF,20,A5,FF,9D,BA,39,E8,C9,
     0D,D0,F5,20,AB,FF,60'BWPM
1109 DATA 20,E4,FF,C9,51,F0,0D,C9,50,
     D0,09,20,E4,FF,C9,00'BWYN
1110 DATA F0,F9,C9,51,60,20,1D,37,AE,
     4C,34,20,C6,FF,20,E4'BWIF
1111 DATA FF,4C,11,37,48,20,1D,37,AE,
     4E,34,4C,0A,37,48,20'BWZG
1112 DATA 1D,37,AE,98,00,F0,06,AE,4D,
     34,20,C9,FF,68,20,D2'BWLH
1113 DATA FF,48,20,39,37,AC,55,34,AE,
     54,34,68,60,8E,54,34'BWTI
1114 DATA 8C,55,34,4C,CC,FF,20,CC,FF,
     AE,4D,34,EA,EA,EA,20'BWJJ
1115 DATA C9,FF,A5,17,A6,16,20,32,8E,
     A5,90,0D,53,34,8D,53'BWLK
1116 DATA 34,60,A9,01,2C,A9,0F,EA,EA,
     EA,60,48,AD,4F,34,85'BWPL
1117 DATA FA,AD,50,34,85,FB,68,60,20,
     42,37,20,4B,37,A9,00'BWGM
1118 DATA A8,91,FA,58,60,A9,01,20,F4,
     36,20,F4,36,A5,16,20'BWWM
1119 DATA F4,36,A5,17,20,F4,36,60,AC,
     5D,34,84,0D,20,42,37'BWXN
1120 DATA A9,00,91,FA,58,AD,4F,34,18,
     69,04,85,3D,A9,00,6D'BWPG
1121 DATA 50,34,85,3E,20,42,37,AD,00,
     FF,48,20,0D,43,68,8D'BWDG
1122 DATA 00,FF,A0,03,C8,B1,FA,20,F4,
     36,D0,F8,58,60,A9,00'BWWI
1123 DATA 20,F4,36,20,F4,36,60,EE,5C,
     34,AE,5C,34,BD,BB,39'BWYJ
1124 DATA 8D,5A,34,BD,BA,39,60,A2,00,
     8E,59,34,20,E5,36,9D'BWYK
1125 DATA BA,39,F0,11,AD,53,34,D0,03,
     E8,D0,F0,08,A9,00,9D'BWVL
1126 DATA BA,39,28,D0,E1,8E,5B,34,A0,
     00,8C,58,34,88,8C,5C'BWFM
1127 DATA 34,20,B7,37,F0,4F,30,14,C9,
     22,D0,0A,48,A9,FF,4D'BWQN
1128 DATA 58,34,8D,58,34,68,20,8F,39,
     4C,F1,37,2C,58,34,10'BWVN
1129 DATA 0D,08,EA,EA,EA,EA,EA,EA,EA,
     EA,EA,28,30,E8,C9,FF'BWAP
1130 DATA F0,E4,20,4A,38,2C,5E,34,10,
     08,48,AD,59,34,20,61'BWUG
1131 DATA 38,68,20,C6,38,2C,5E,34,10,
     08,AD,5A,34,30,03,20'BWWH
1132 DATA 61,38,4C,F1,37,A9,0D,4C,FE,
     36,C9,AA,90,0E,C9,AF'BWUJ
1133 DATA 90,08,C9,B1,90,06,C9,B4,B0,
     02,18,24,38,6E,5E,34'BWCK
1134 DATA 60,AE,47,34,10,15,C9,30,90,
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UNIV. PROGRAM LISTER

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        11,C9,3A,9Ø,Ø8,C9,4Ø'BWFK
1135 DATA 9Ø,Ø9,C9,5B,BØ,Ø5,A9,2Ø,2Ø,
        FE,36,6Ø,8A,48,A2,Ø5'BWIM
1136 DATA AD,5A,34,C9,28,FØ,2A,CA,BØ,
        27,C9,ØØ,FØ,23,A2,Ø6'BWEN
1137 DATA DØ,ØD,8A,48,A2,Ø6,AD,5A,34,
        1Ø,Ø4,29,7F,A2,Ø2,8D'BWDO
1138 DATA 56,34,EE,56,34,A9,8Ø,8D,5E,
        34,8A,48,2Ø,B7,37,68'BWCP
1139 DATA AA,8E,52,34,EC,46,34,FØ,Ø6,
        2Ø,76,36,2Ø,6F,39,68'BWJQ
114Ø DATA AA,6Ø,EA,EA,EA,6Ø,8D,56,34,
        8D,57,34,AE,52,34,EC'BWLI
1141 DATA 46,34,FØ,Ø7,8A,48,2Ø,6F,39,
        68,AA,8E,46,34,A2,Ø7'BWMJ
1142 DATA AD,57,34,DD,E3,34,BØ,Ø3,CA,
        1Ø,F8,AD,57,34,38,FD'BWPK
1143 DATA E3,34,8D,56,34,EE,56,34,EØ,
        Ø3,DØ,Ø5,2Ø,7C,38,DØ'BWML
1144 DATA 12,EØ,Ø2,9Ø,ØE,EØ,Ø6,BØ,Ø3,
        2Ø,C2,38,EØ,Ø7,DØ,Ø3'BWLL
1145 DATA 2Ø,92,38,8A,ØA,AA,AD,52,34,
        ØA,A8,B9,5B,35,85,FE'BWXN
1146 DATA C8,B9,5B,35,85,FF,8A,A8,2Ø,
        45,37,B1,FE,85,FC,C8'BWWO
1147 DATA B1,FE,85,FD,58,DØ,14,AE,52,
        34,E8,EØ,Ø7,BØ,23,8E'BWHP
1148 DATA 52,34,2Ø,76,36,2Ø,6F,39,4C,
        DE,38,AE,56,34,AØ,ØØ'BWAP
1149 DATA CA,DØ,21,2Ø,7D,39,FØ,DF,Ø8,
        29,7F,2Ø,8F,39,28,1Ø'BWIR
115Ø DATA F2,6Ø,A9,21,2Ø,8F,39,A9,4Ø,
        ØD,6Ø,34,8D,6Ø,34,38'BWPI
1151 DATA 6E,4B,34,6Ø,2Ø,7D,39,FØ,BE,
        1Ø,F9,3Ø,D3,Ø8,2Ø,45'BWIK
1152 DATA 37,AØ,ØØ,B1,FC,A8,E6,FC,DØ,
        Ø2,E6,FD,28,98,6Ø,8D'BWXL
1153 DATA 59,34,8A,48,98,48,2Ø,42,37,
        AD,59,34,2Ø,FE,36,AC'BWUM
1154 DATA 5D,34,CC,51,34,BØ,Ø5,91,FA,
        EE,5D,34,Ø8,ØE,6Ø,34'BWMN
1155 DATA 28,6E,6Ø,34,58,68,A8,68,AA,
        6Ø,END'BIJL
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END

Universal Program Lister

PET, C64 Plus/4, C128, B128,

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6Ø2Ø REM !!  DO NOT PUSH RETURN
     OVER'BVBG
6Ø3Ø REM !!  ANY LINES WHICH
     CONTAIN'BWDH
6Ø4Ø REM !!  KEYWORDS > PET2 OR
     THIS'BVWI
6Ø5Ø REM !!  PROGRAM WILL NOT RUN
     IN'BVHJ
6Ø6Ø REM !!  ALL CBM MACHINES. ALSO,
     'BWBK
6Ø7Ø REM !!  DO NOT MERGE THIS
     PRG'BTEK
6Ø8Ø REM !!  INTO YOUR MACHINE -
     THE'BVRM
6Ø9Ø REM !!  TOKENS MUST REMAIN
     AS'BULN
61ØØ REM !!  ORIGINALLY CODED.'BSME
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6110 REM !!  ::: MARK THE
     SENSITIVE'BVSG
6120 REM !!  LINES.
     LIZ.'BMAE
6125 :'ABHG
6130 REM---SET TM,LOAD FILES'BSWH
6140 IF LF GOTO 6510'CGNF
6150 DATA PET2,48,96,1,6000,PET4,48,
     96,1,6000,C64?,51,96,1,6000'BDBP
6160 DATA PL4?,51,96,1,6000,C16?,51,
     48,1,3000,B128,0,80,0,5000'BCWP
6170 DATA C128,0,48,0,3000'BQJJ
6180 PRINT"[DOWN]PROGRAM LISTER AND
     CONVERTER"'BACP
6190 PRINT"ELIZABETH DEAL"'BAPM
6200 PRINT"[DOWN]IN WHICH COMPUTER IS
     THIS RUNNING NOW"'BAJK
6210 PRINT"A=PET2 B=PET4 C=C64 D=PL4
     E=C16"'BATJ
6220 PRINT"F=B128 G=C128"'BAJF
6230 INPUT"[SPACE3]F[LEFT3]";N$'BDDG
6240 N=ASC(N$)-64:IF N<1 OR N>7 THEN
     PRINT"CAN'T DO THAT YET":END'KNER
6250 IF N<6 GOTO 6290:REM SKIP NEXT 2
     IF NOT B128,NOT C128'EIDP
6260 :::IF N>5 THEN BB=15
     :IF N=7 THEN BANK BB:GOTO 6290
     :REM C128 BANK BB,
     SKIP 2LINES'KRSW
6270 :::AUTO BB:REM BANK BB IN
     B128'CSJM
6280 POKE 21984,85:IF PEEK(21984)<>85
     THEN PRINT"NO ROOM":END
     :ON LY B128'JBWV
6290 FOR J=1 TO N:READ N$,P,TM,TL,KA$
     :NEXT J:REM STRING PTS TO
     DATA'GLEW
6300 A1=TM*256:A=A1+1088'EPOH
6310 IF N<6 THEN POKE P,0:POKE P+4,0
     :POKE P+1,TM:POKE P+5,TM
     :REM NO TM CHANGE B/C128'LOCS
6320 V$="V4":U$="8":D$="0":U=VAL(U$)
     :DR=VAL(D$):REM UNIT,
     DRIVE FOR SETUP ONLY'ITUV
6330 REM--IF NOT YET LOADED,
      LOAD KEYWORDS+MCODE'BKPO
6340 A$="LOADING FROM UNIT "+U$+",
      DR."+D$+":"'FGHP
6350 IF PEEK(A1)*PEEK(A1+1)=69*78
     GOTO 6510'IRWO
6360 N$="+"+N$+".KLST "+V$'EGCM
6370 LF=1:PRINT A$N$'CIFL
6380 IF TL THEN LOAD D$+":"+N$,U,1
     :REM GOES TO RUN'GUIS
6470 :::IF N=6 THEN PUDEF (N$),U(U),
     D(DR),B(BB):REM BLOAD B128'FLBU
6480 :::IF N=7 THEN BLOAD (N$),U(U),
     D(DR),B(BB):REM BLOAD C128'FMDV
6500 REM---INTERROGATION'BQAH
6510 PRINT"[DOWN]LOTS OF QUESTIONS
     COMING UP..."'BAJM
6520 PRINT"FOR A PLAIN SCREEN LISTING,
      JUST"'BAJO
6530 PRINT"ENTER THE PROGRAM NAME AND
     PUSH"'BADO
6540 PRINT"RETURN OVER ALL THE
     REMAINING"'BALP
6550 PRINT"QUERIES TO USE DEFAULTS
     UNDER"'BAGQ
6560 PRINT"THE CURSOR. IF YOU MUST
     ABORT,"'BAIR
6570 PRINT"TYPE IN SILLY VALUES,
      OR USE THE"'BART
6580 PRINT"STOP KEY WHEN REINPUT
     CHOICE IS"'BAIU
6590 PRINT"GIVEN."'BATO
6600 PRINT"[DOWN,RVS]1[RVOFF]
      PROCESS WHICH BASIC
     PROGRAM"'BALN
6610 PRINT"(PUSH RETURN TO QUIT)"'BAWL
6620 INPUT"[SPACE3]*[LEFT3]";I1$
     :L=LEN(I1$):IF L=1 THEN END'HOYP
6630 IF RIGHT$(I1$,1)="*"THEN
     L=L-1'GKXN
6640 IN$=LEFT$(I1$,L)'CKFL
6650 GOSUB 7300:U$=UN$:U1=VAL(UN$)
     :IF U1<8 THEN END'IWVT
6660 GOSUB 7280:D1$=DX$'CLMN
6670 I2$="LS."+IN$:I3$="PR."+IN$'ENXS
6680 PRINT"GUESS SOURCE COMPUTER TYPE
     :"'BAIU
6690 PRINT"(I MAY FAIL TO DISTINGUISH
     4 VS 5/6)"'BABW
6700 PRINT"0=PET1[SPACE4]
     1=PET2/VIC/C64[SPACE3]
     2=C64+EXP"'BAXN
6710 PRINT"3=PET4[SPACE4]
     4=B128/256"'BAHK
6720 PRINT"5=+4/C16[SPACE2]
     6=C128"'BAAK
6730 INPUT"[SPACE3]5[LEFT3]";T$
     :T1=ASC(T$)-48:IF T1<0 OR T1>6
     THEN END'KTVV
6740 PRINT"[RVS]2[RVOFF]
      OUTPUT LISTING TO:"'BAAP
6750 PRINT"DISK(8+)[SPACE3]PRINTER(4,
     5)[SPACE2]SCREEN(3)"'BAFS
6760 UX=3:GOSUB 7310:U2=VAL(UN$)'EQPR
6770 IF U2>7 THEN GOSUB 7280
     :D2$=DX$'FOSS
6780 INPUT"SPACES BETWEEN KEYWORDS
     [SPACE3]Y[LEFT3]";SP$
     :SP=127-(SP$="Y")'EPSD
6790 INPUT"TRANSLATE CONTROL
     CHARACTERS[SPACE3]Y[LEFT3]";T$
     :IF ASC(T$)=78 GOTO 6820'FOMF
6800 PRINT"[SPACE3]SORRY. IT'S TOO
     HARD."'BAQM
6810 PRINT"[SPACE3]USE 'LIST ALL' BY
     JIM BUTTERFIELD."'BAHQ
6820 INPUT"[RVS]3[RVOFF]
      CRUNCH AND SAVE AS A PROGRAM
     FILE[SPACE3]N[LEFT3]";SV$'BEMV
6830 SV=-(ASC(SV$)=89):IF SV=0 GOTO
     6860'HTLS
6840 GOSUB 7300:U3=VAL(UN$)
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    :IF U3<8 THEN END'HQHS
685Ø GOSUB 728Ø:D3$=DX$'CLOO
686Ø PRINT"[DOWN]PUSH F TO FIX INPUTS,
     ANY KEY TO GO"'BAMV
687Ø GOSUB 732Ø:IF I$="F"GOTO
     66ØØ'ELQR
688Ø PRINT"[UP,RVS,SPACE4]Q QUITS,
     P PAUSES, ANYKEY STARTS[SPACE3,
    DOWN]"'BAAY
689Ø REM---OPEN PRG FILE TO READ'BUQV
69ØØ F$=D1$+I1$+",P,R":C=4
    :OPEN C,U1,15'FTDP
691Ø OPEN 1,U1,3,F$:GOSUB 72ØØ'COHM
692Ø REM---OPEN SEQ FILE TO WRITE'BVBP
693Ø F$=D2$+I2$+",S,W"'DIYO
694Ø IF U2<5 THEN OPEN 2,U2
    :PRINT#2,"LISTING: "I1$:PRINT#2
    :GOTO 698Ø'HUNW
695Ø IF U2<>U1 THEN C=5
    :OPEN C,U2,15'GOUT
696Ø CLOSE 2:OPEN 2,U2,4,F$:SC=Ø
    :GOSUB 72ØØ:IF SC GOTO 696Ø'GCDW
697Ø REM---OPEN PRG FILE TO WRITE'BVBU
698Ø F$=D3$+I3$+",P,W"'DIXT
699Ø IF SV=Ø GOTO 7Ø4Ø'DHFT
7ØØØ IF(U3<>U1)AND(U3<>U2)THEN C=6
    :OPEN C,U3,15'JWTJ
7Ø1Ø CLOSE 3:OPEN 3,U3,5,F$:SC=Ø
    :GOSUB 72ØØ:IF SC GOTO 7Ø1Ø'GCTJ
7Ø2Ø PRINT#3,CHR$(1)CHR$(4);
    :GOSUB 72ØØ'EOLG
7Ø3Ø REM---HERE WE DO THE WORK'BSPH
7Ø4Ø POKE A+6,T1:POKE A+7,SP
    :POKE A+8,U1:POKE A+9,U2
    :POKE A+1Ø,U3'KFXQ
7Ø5Ø SYS A+3*SV:IF SV=Ø GOTO 716Ø'GMIK
7Ø6Ø PRINT"[UP]CHECK THE LISTING TO
    MAKE SURE"'BAKO
7Ø7Ø PRINT"THAT PRG FILE IS OK. LONG
    PRG LINES ARE"'BASQ
7Ø8Ø PRINT"CHOPPED. YOU CAN ADD TO
    THEM LATER."'BAGQ
7Ø9Ø PRINT"[DOWN]TO RUN IN THIS
    COMPUTER, YOU WILL"'BAMR
71ØØ PRINT"LIKELY NEED TO GO OVER THE
    LISTING TO"'BASK
711Ø PRINT"FIND ADDITIONAL ITEMS TO
    CONVERT, E.G."'BAXL
712Ø PRINT"DS,DS$,TI,TI$,ERR$,EN,
    EL PLUS ALL THE"'BACM
713Ø PRINT"COMMANDS YOUR COMPUTER
    CAN'T HANDLE."'BALN
714Ø PRINT"BUT IT IS OK TO EDIT THE
    NEW"'BAXL
715Ø PRINT"PROGRAM AS MUCH AS YOU
    WANT."'BAIN
716Ø IF(PEEK(A+11)AND 128)=Ø THEN
    PRINT"!PROGRAM LOOKS OK."
    :GOTO 719Ø'IQUT
717Ø PRINT"SOURCE TYPE# IS WRONG OR
    BASIC LINE"'BAAR
718Ø PRINT"LENGTH(S) EXCEED THE
    PERMITTED LIMIT."'BAMS
719Ø GOTO 66ØØ'BEJK
72ØØ GET#C,E1$,E2$:E=E1$<>"Ø"
    :PRINT F$": "E1$E2$;'FABJ
721Ø GET#C,E$:PRINT E$;
    :IF E$<>CHR$(13)GOTO 721Ø'HUPK
722Ø IF E=Ø THEN RETURN'ECFF
723Ø IF E1$+E2$<>"63"GOTO 727Ø'FKUJ
724Ø SC=1:INPUT"SCRATCH IT[SPACE3]Y
    [LEFT3]";I$:IF I$<>"Y"GOTO
    727Ø'GONR
725Ø PRINT"HOPE DISK HAS NO *
    FILES"'BAJM
726Ø PRINT#C,"S"+LEFT$(F$,LEN(F$)-4)
    :GOTO 72ØØ'GRGO
727Ø CLOSE 1:CLOSE 2:CLOSE 3:CLOSE 12
    :CLOSE 13:CLOSE 15:END'HPTP
728Ø INPUT"DRIVE[SPACE3]Ø[LEFT3]";DX$
    :IF DX$<"Ø"OR DX$>"1"THEN
    END'HLBU
729Ø DX$=DX$+":":RETURN'DHWN
73ØØ UX=8'BDAD
731Ø PRINT"DEVICE[SPACE3]"UX;
    :INPUT"[LEFT4]";UN$:RETURN'DJBL
732Ø GET I$:IF I$=""GOTO 732Ø'EJUI
733Ø RETURN'BAQF
734Ø REM----------------------------
    ------------------------'BDXP
```

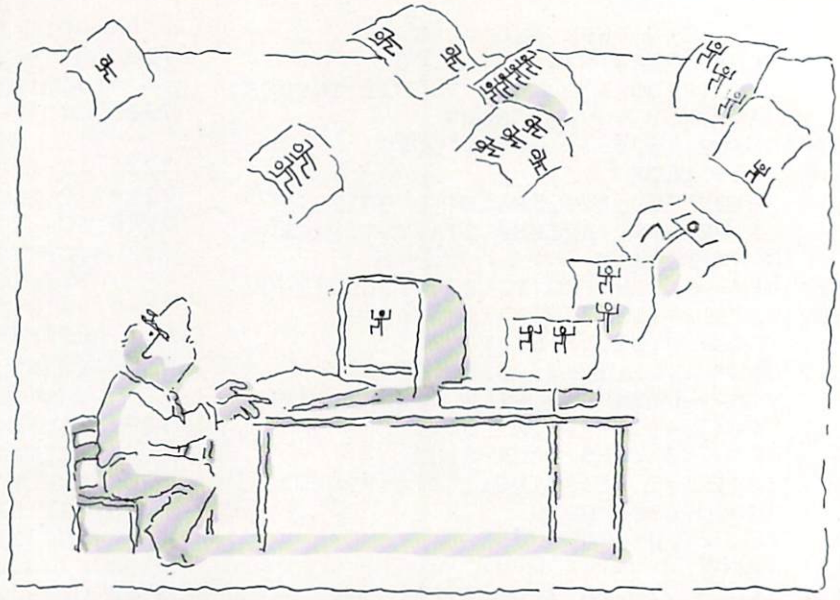
END

BY MARK JORDAN

The 128 Mode

Sprite Printer

Explore the Commodore 128 in its powerful native mode. Some of the articles in this column may be technical, some not so technical—but we guarantee that they will spark your creativity.



This month's topic is one of my favorites—sprites. I love the little critters. Not only do they make programming games a snap, they are an art form in themselves. Of course, we need a way to print them, so this month's program is Sprite Printer.

Sprite Printer allows you to print out hard copy of sprites on your Epson/Star-compatible dot-matrix printer up to eight at a time across the page. Features include the ability to control the spacing between them, single- or double-density printing, and regular or expanded size. And here's the best news of all. You can now print out sprites from some commercial games from the 64 mode. The only hitch is that you must have an Epson/Star type of printer.

Sprite Printer incorporates an active SPRDEF. That means you can design and modify sprites while the program is running. This is a very powerful feature of SPRDEF, as you will see.

Using Sprite Printer

Using the program is self-explanatory, though you will waste paper at times trying to decide where to position your sprites. Please keep in mind that when the program asks you what column to place your first sprite in, it means what dot column, not character column.

One of the program's options allows you to either create sprites or load in a previously-saved sprite file. Later, we'll look at how to save files for use with Sprite Printer. For now, let's go through a sample Create run.

Run the program. When it asks you whether you want to create or load, choose C. Once in the editor, press 1 to choose sprite 1. Now use your cursor keys and the 2 key to draw your figure. When finished, press Shift-RETURN followed by RETURN. You'll be trans- ported back to the main program flow.

From here you can decide where to place your sprite(s) on the printed page, how many to print, and so on. Then the printing begins. The printing routine is written as a machine-language/BASIC hybrid so it is fairly fast. Once done, you can repeat the whole process.

SPRDEF in Action

When I first got a 128, one of the happiest discoveries I made was SPRDEF, the built-in sprite editor. No longer would I have to load in an editor when designing sprites—now I could design sprites as I developed my programs.

You probably have used SPRDEF to edit some sprites. As a sprite editor, SPRDEF is good. But SPRDEF has another side that, as yet, has not been explored in much detail: its ability to be inserted actively within a program. By inserting a SPRDEF command within a program, your program will allow the user to edit sprites while the program is running.

Is this useful? I say yes, though time alone will tell how much creative use it will get. How about a game that thrusts the player into SPRDEF where he must modify or rearrange sprites in order to solve his quest? Or maybe a word processor that allows you to do a quick letterhead character while you're word processing?

For example, you could use this program to type a spritely message. Choosing the Create option, start with sprite 1 and create sprite-words. Each sprite can contain up to six letters. Thus, you could create a personalized font with up to 48 letters across the page.

As mentioned, there is nothing tricky at all about using SPRDEF within a program. Simply type it as a command and off you go, leaving your host program's flow while you edit sprites, only to return when you type a shifted-RETURN followed by RETURN.

In other words, once your program finds and executes a SPRDEF command, it treats it like a subroutine. Lines 140 and 220 of Sprite Printer do this. This not only allows you to edit sprites but also allows you to manipulate the arrangement of sprites prior to printing them.

While the system guide explains the process of editing sprites in good detail on pages 116-118 and 293-294, a few reminders are in order. First, when you enter SPRDEF, you will have to designate which sprite you wish to edit (1-8) by pressing the appropriate key. Later, if you wish to edit another sprite, you need to press shift- RETURN. Again, you follow with the sprite number you wish to edit. If you press RETURN alone at this point, you will exit SPRDEF.

Also, to make full use of Sprite Printer you need to know how to move sprites from one position to another. You can do this quite simply with the Copy Feature which works as follows.

- Go to the sprite position (1-8) you wish to copy to.

- Press C.
- Type the number of the sprite you wish to copy.

Keep in mind that if you have eight sprites designed at one time and you copy one to another position, one sprite shape will be lost. For example, if you copy sprite 8 to sprite 1, the original sprite 1 disappears.

There are ways you can get around this restriction, but you must exit SPRDEF to do so. While this won't work while Sprite Printer is running, you can do so prior to running the program. Here's how.

- Save sprite 1 to a string variable: SPRSAV 1,a$
- Enter SPRDEF: SPRDEF (+ RETURN).
- Copy sprite 8 to 1.
- Exit SPRDEF.
- Save string variable back to sprite 8: SPRSAV a$,8.

Finally, no discussion of SPRDEF would be complete without a reference to BSAVE/BLOAD. The sprites you design using SPRDEF need to be saved to disk and BSAVE makes it easy. Once your sprites are set, exit SPRDEF and type BSAVE "spritename",B0,P3584 to P4096. The B0 means bank zero, which is the memory bank your sprites are in. The P3584 to P4096 are the memory locations within that bank that contain the sprite data.

To load the sprite shapes back at any time, simply type BLOAD "spritename". Sprite Printer will load previously saved files for you to print.

Knowledge of the preceding is essential for stealing sprites from commercial games and printing them out with Sprite Printer. You also need to know how to go back and forth from 64 to 128 mode.

Warning: It doesn't always work. Encouragement: It often does. First, make sure the 40/80 button on your computer is up. Also, do not use a fast-load cartridge. This prevents you from ever going into 128 mode from 64 mode.

Now power-up in 64 mode (hold down the Commodore key) and load the program that contains the sprites you want. Next, press the reset button on your computer (next to the power switch). You will now find yourself looking at the BASIC 7.0 startup message.

Now type in the following short program (DSAVE it for future projects).

```
10 TRAP 50
20 SPRITE 1,1,1:MOVSPR 1,100,100
30 FOR T=0 TO 255:POKE
     2040,T:SLEEP 1:NEXT
40 END
50 FOR I=0 TO 512:POKE
     3584+I,PEEK(T*64+I):NEXT
```

Run this program. You will see a black sprite on the screen, changing its shape every second (thanks to the SLEEP 1 command). If it happens to hit the right batch of memory that your 64 program had its sprites at, you'll see a sprite.

If that happens, press RUN/STOP immediately. The sprite you see plus the next seven in memory will be loaded into the 128's sprite memory area.

Now you can enter SPRDEF and examine the sprites. If you like them, exit SPRDEF and BSAVE them exactly as explained above. They are now ready to use in Sprite Printer.

While this technique won't get all commercial games, it could— if you were willing to do some bank switching with the VIC-II chip. That's beyond the scope of this article, but I know some of you out there are up to it.

Finally, power-users of Sprite Printer will find it useful in another way—as a clever little screen dump. This involves knowledge of SSHAPE, GSHAPE and SPRSAV. Here are the nine easy steps.

- Exit Sprite Printer.
- Go into bitmapped mode and using BASIC design a screen (or load in a favorite on disk).
- Use SSHAPE to save eight consecutive blocks of screen as eight sprites shoulder to shoulder. These must be placed exactly 24 pixels wide, 21 deep. Example:
  FOR T=1 TO 8:SSHAPE A$(T),T*24,10,T*24+23,31:NEXT
- Use SPRSAV to convert these blocks from shapes to sprites. Example: FOR T=1 TO 8:SPRSAV A$(T),T:NEXT
- BSAVE these sprites.
- Run Sprite Printer.
- Choose the load option and load the file you just saved.
- Place these sprites with 0 spaces between them.
- Print them.

Voila! A mini high-resolution screen dump. You can even double its size.

Okay, it's your turn. Send your ideas on using Sprite Printer and SPRDEF within a program to me in care of this magazine. Who knows, I may use your idea in a future column. C

Getting Your Printer to Work

No doubt, some of you will have trouble getting things to work right at first. This is not the fault of the program. It's your interface's problem (the deserved scapegoat of all printing woes). You will need to put your interface into transparent mode. The secondary address of 5 in line 90 of the program should put most printers into transparent mode, but not all. Check your interface manual and make the appropriate changes. Experiment.

Another possible source of trouble is that you aren't using an Epson-compatible printer. What you'll need to do in that case is find out how your printer produces bitmapped graphics. If it prints 8-pin graphics that count from 0 to 127 from the bottom up, you're in luck. All you need to do is alter the escape sequences the following lines to match your printer's requirements.

Line 110: this sets lines spacing for graphics.

Line 430: this sets total graphics data.

Line 550: this resets the printer. C

Before typing this program, read "How to Enter Programs" and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Sprite Printer

```
10 FOR T=2816 TO T+101:READ A$
   :POKE T,DEC(A$):NEXT'IUTG
20 DIM SP$(8):FK=PEEK(4096)'DPGD
30 DN$="S":DB$="S":CN=0:NS=1:DA=0
   :E$=CHR$(27):J$=E$+"J"'JGNN
40 FOR T=1 TO 8:SPRITE T,0,16
   :NEXT'FMJF
```

```
50 PRINT CHR$(14)"[GRAY3]":COLOR 0,1
   :COLOR 4,12'ENRH
60 PRINT"[CLEAR]"," [SHFT T]
   URN ON PRINTER."'BBBI
70 PRINT,"[LEFT3,SHFT P]
   RESS ANY KEY WHEN READY."'BBFM
80 GET KEY A$'CCEF
90 OPEN 4,4,5'BFWG
100 FOR T=1 TO 8:A$(T)="":NEXT
    :SD=3648'GRHC
110 PRINT#4,CHR$(27)CHR$(51)CHR$(16);
    :REM --- SET LINE SPACING'FIAH
120 PRINT"[DOWN,RVS,WHITE,SHFT C,
    GRAY3,RVOFF]REATE OR [WHITE,RVS,
    SHFT L,GRAY3,RVOFF]OAD: [SHFT C]";
    :INPUT"[LEFT3]";CC$'CGGJ
130 IF ER=30 THEN RESUME 160'EHYC
140 IF CC$="C" OR CC$="[SHFT C]
    "THEN SPRDEF:GOTO 240'HLWH
150 TRAP 130'BDGB
160 PRINT"[DOWN2,SHFT F]ILENAME"'BAGE
170 PRINT"(PRESS [WHITE,RVS]
    [BACK ARROW] [GRAY3,RVOFF]
     TO VIEW DIRECTORY)"'BAIL
180 INPUT"[UP2,RIGHT8]";SF$'BELG
190 IF SF$="[BACK ARROW]
    "THEN DIRECTORY:GOTO 170
    :ELSE BLOAD (SF$)'HORM
200 PRINT"[DOWN,SHFT P]RESS [RVS,
    WHITE,SHFT V,GRAY3,RVOFF]
     TO VIEW AND REARRANGE
    SPRITES"'BAKJ
210 TRAP 560'BDNX
220 GET KEY A$:IF A$="V"THEN
    SPRDEF'GGSD
230 POKE 4096,FK'BHNB
240 PRINT"[DOWN,RVS,WHITE,SHFT S,
    GRAY3,RVOFF]INGLE OR [RVS,WHITE,
    SHFT D,GRAY3,RVOFF]OUBLE DENSITY
    [SPACE3]"DN$;:INPUT"[LEFT3]";DN$
    :DN=75:D=1:IF DN$="D"THEN DN=76
    :D=2'JDIA
250 PRINT"[DOWN,RVS,WHITE,SHFT S,
    GRAY3,RVOFF]INGLE OR [RVS,WHITE,
    SHFT D,GRAY3,RVOFF]OUBLE SIZE
    [SPACE3]"DB$;:INPUT"[LEFT3]";DB$
    :DB=1:IF DB$="D"THEN DB=2
    :SD=3712'ICUY
260 PRINT:PRINT"[SHFT S]
    TART AT WHAT COLUMN (0-615)
    [SPACE3]"CN;J$TAB(30);
    :INPUT CN'ENUP
270 PRINT"[DOWN,SHFT H]
    OW MANY SPRITES (1 - 8)[SPACE2]";
    NS;:INPUT"[LEFT4]";NS
    :IF NS=1 THEN 290'FPGT
280 PRINT:PRINT"[SHFT H]
    OW FAR APART FROM EACH OTHER
    [SPACE3]"DA;J$TAB(31)
    :INPUT DA'EMVR
290 CC=CN+(NS*D*DB*24)+DA*NS'HRVO
300 IF CC>480*D THEN PRINT"[CLEAR,
    BELL,SHFT N]OT ENOUGH SPACE.
    [SPACE2,SHFT R]E-SET MARGINS."
    :SLEEP 2:GOTO 240'HNSO
310 N2=INT(CC/256):N1=CC-N2*256'GTIG
320 POKE 253,72*DB'CIWB
330 PRINT"[CLEAR]":FAST'CCMC
340 FOR T=1 TO 8:SPRSAV T,SP$(T)
    :NEXT'FOMH
350 FOR SP=1 TO NS:SPRSAV SP$(SP),
    1'EQCI
360 : FOR T=SD TO T+64:POKE T,0
    :NEXT'GMKJ
370 : IF DB$="D"THEN SPRSAV 1,4
    :SYS 2881'FNRK
380 : SYS 2816'BFSG
390 : FOR T=3072 TO T+72*DB
    :A$(SP)=A$(SP)+CHR$(PEEK(T))
    :NEXT'KFBT
400 NEXT'BAEX
410 :'ABHY
420 FOR I=1 TO 3*DB'EFGD
430 : PRINT#4,CHR$(27);CHR$(DN);
    CHR$(N1);CHR$(N2);'FXTJ
440 : CX=0:DO UNTIL CX=CN
    :PRINT#4,CHR$(0);:CX=CX+1:LOOP
    :CX=1'KCTQ
450 : FOR J=1 TO NS'DFTG
460 :   FOR T=1 TO 24:P=ASC(MID$(A$(J)
    ,(I-1)*24+T,1))'JBUP
470 :     FOR DD=1 TO DB'DGEI
480 :       PRINT#4,CHR$(P);
    :IF DN=76 THEN PRINT#4,CHR$(P);
    'HSPO
490 :     NEXT'BBMH
500 :   NEXT'BBMY
510 :   DO UNTIL CX=DA+1
    :PRINT#4,CHR$(0);:CX=CX+1:LOOP
    :CX=1'KYSN
520 : NEXT:PRINT#4,CHR$(10)'DICE
530 : IF I=3*DB-1 THEN PRINT#4,
    CHR$(27);CHR$(51);CHR$(10);'JXAM
540 NEXT:SLOW'CCXE
550 POKE 208,0:PRINT"[CLEAR,SPACE11,
    SHFT A]NYMORE?[SPACE2,SHFT Y]/
    [SHFT N]":GET KEY Y$
    :IF Y$="Y"THEN 100:ELSE PRINT#4,
    CHR$(27);CHR$(64):CLOSE 4:END'NFAB
560 SLOW:PRINT ERR$(ER)"IN LINE"EL
    :PRINT#4:CLOSE 4'FMJN
570 END'BACG
580 DATA A9,03,85,FA,A9,08,85,FB'BXTM
590 DATA 85,FC,A9,00,EA,EA,85,FE'BXNN
600 DATA A0,00,A6,FE,B9,00,0E,0A'BXYF
610 DATA 3E,00,0C,E8,C6,FB,D0,F7'BXMG
620 DATA A9,08,85,FB,C8,C6,FA,D0'BXYH
630 DATA EB,A9,03,85,FA,C6,FC,D0'BXHI
640 DATA E1,A9,08,85,FC,A5,FE,18'BXKJ
650 DATA 69,18,85,FE,C5,FD,90,D2'BXDK
660 DATA 60,A2,00,A0,00,84,FA,B9'BXVL
670 DATA C0,0E,9D,00,0E,9D,03,0E'BXTM
680 DATA C8,E8,E6,FA,A5,FA,C9,03'BXPN
690 DATA D0,ED,A9,00,85,FA,E8,E8'BXXO
700 DATA E8,E0,7E,90,E2,60'BRTF
```

END

SILICON VALLEY INSIDER

Continued from pg. 12

levels of opponents and over 100 different screens keep you very busy.

Progressive Peripherals & Software is releasing **CLI-Mate**, a utility program for the Amiga. This program operates from Workbench to provide many important disk management options. Files can be copied, renamed and deleted using the mouse. New directories can also be created. Text files can be sent to a printer or screen with control over the page length, margins and page numbering. IFF graphics files can be viewed as well. Disks can be formatted in either normal or fast format mode. Also for the Amiga is the **Megaboard**, a 2MByte RAM expansion board.

I've been using **Superbase Personal** for the Amiga, also from Progressive Peripherals & Software, for about two weeks now. This is a powerful, sophisticated relational database program with IFF graphics capability. The short time I've had to use it has only let me touch on some of its capabilities, but so far I'm very impressed. Strong use has been made of the Amiga's Workbench interface and this lets **Superbase** be very user friendly. Its only drawback is the dongle used for copy protection; I think dongles are too easily lost or misplaced.

Electronic Arts keeps grinding out more entertainment software for Commodore computers. For the 64 is **Computer Scrabble**. This is a faithful recreation of the board game. It includes a playing vocabulary that you can expand to 20,000 words that checks every move. There are four levels of difficulty and up to four players can participate. You may also play against the computer.

World Tour Golf is a whimsical graphic simulation of the most misunderstood of sports—golf. Twenty-four courses are included, as is a course construction set. You can add trees, sand traps, water barriers, greens, rough and the tee. The hole difficulty, slope and skyline can also be set. Odd handicaps can be added to the course. For example, cows and a giant lizard may eat your ball!

Random elements of wind, green speed and the lie of the ball add to the fun. One to four players can participate or you can play against robot players controlled by the computer.

PHM Pegasus is a simulation of a Patrol Hydrofoil Misslecraft created by Lucasfilm Games for Electronic Arts. You are the captain of one of three types of Hydrofoil craft on one of eight missions. You may be escorting a convoy in the Caribbean, running a seek-and-destroy attack in the Gulf of Sidra, or flanking an enemy fleet in the Mediterranean. Your weapons may include 76mm guns, Harpoon or Gabriel missiles, or just ramming the enemy. Long range radar, chaff missiles, radar lock warning, and your maximum 50-knot speed make up your defense. Scout helicopters can keep you informed of events beyond your radar.

For the Amiga comes **Ogre**, a computer-enhanced strategy board game for one or two players. The solo-fighting Cybertank Ogre is pitted against conventional forces of infantry, armor units and command posts. The Ogre is armed with missiles, main and secondary batteries, and antipersonnel guns. There are ten different playfields and a game editor is included so players can design their own.

The New Technology Coloring Book is a simple color-by-number library of prepared images that teaches users about modern technology while painting electronic images. Text screens are keyed to each image to provide more information on each subject. The program is based on the theory that information is more easily absorbed if presented both verbally and visually.

Coming soon from Electronic Arts for the Amiga are a new fantasy role-playing game by Freeman Associates and a jet flight simulator.

Gold Disk has released **PageSetter**. This is a page make-up program that will open the door to desktop publishing for Amiga owners. It will accept text and graphics created by other programs or you can use the built-in text and graphics editors to key in information directly. All text and graphics are positioned on the page using boxes that can be repositioned at any time. Text boxes can be linked to flow text from column to column, page to page. This looks to be an important addition to the Amiga's capabilities.

Finally, from **Brown-Wagh** comes **Organize!** for the Amiga. This database program follows their **Scribble!** word processor, **Analyze!** spreadsheet and **OnLine!** telecommunications package—a full set of applications from one publisher. **Organize!** runs from the Workbench, is fully compatible with the Amiga's user interface, and is not copy protected. You can create custom reports, mailing lists and mail merge files. Data can be searched using Boolean operators, calculated fields are possible, and all user preferences can be saved as a project. Very nice. C

BY TIM JONES

AmigaBASIC Tutorial

Part 4: Graphics

A short program demonstrates difficult areas of AmigaBASIC, offering both tips on confusing areas and tricks to make your life easier. Rather than an article followed by a program, we have combined them for the sake of clarity.

```
ScreenWindow:
  SCREEN 1,320,200,5,1
  WINDOW 2,"AmigaBASIC Static Graphics",(0,0)-(297,186),31,1
  WINDOW CLOSE 1
  RANDOMIZE TIMER

PixelWork:
  ' The first subject be the PSET and PRESET functions.
  ' These are the two simplest Graphics functions available
  ' to us. Both operate on a single dot, or PIXEL. PSET is
  ' used to turn a PIXEL on and PRESET turns it off. The
  ' SYNTAX of these functions is as follows:

  '        PSET(Xlocation,Ylocation),Color
  '        PRESET(Xlocation,Ylocation)[,Color]

  ' Xlocation and Ylocation are the X and Y PIXEL locations
  ' and Color is the number of the pen you wish to use to.
  ' NOTE: if the [,Color] option is used with PRESET, it
  ' will function like PSET.

  ' In the following example, we clear the window and use an
  ' array with PSET to place random colored pixels on the
  ' screen. Then, using the array in reverse order, we erase
  ' them with PRESET.

  PALETTE 0,0,0,0        ' Give us a Black background
  CLS : DIM X(500),Y(500)
  LOCATE 23,5 : PRINT "Let's see some spots...";
  FOR Count = 1 TO 500
    X(Count) = INT(RND * 310)
    Y(Count) = INT(RND * 170)
    Colour = INT(RND * 13) + 2
    PSET(X(Count),Y(Count)), Colour
  NEXT Count
  LOCATE 23,5 : PRINT "Now We Erase them with PRESET...";
  FOR Delay = 1 TO 3000 : NEXT Delay
  FOR Count = 500 TO 1 STEP -1
    PRESET(X(Count),Y(Count))
    FOR Delay = 1 TO 30 : NEXT Delay
  NEXT Count
  LOCATE 23,5 : PRINT "Click to Continue..." + SPACE$(15);
  Driver
  ERASE X,Y

  ' The arrays, X(Count) and Y(Count) placing random PIXELS
  ' on and then erase them. The arrays let us keep track of
  ' where the PIXELS were placed. The delay loop in the
  ' erase loop slows down the erasure so you can watch it.

  ' One other function applies to single PIXEL graphics.
  ' This is the POINT function, which you can use to find
  ' the color of a specific PIXEL on the screen. To use
  ' POINT, you assign the value returned to a variable, or
  ' use it in a calculation or display call. The SYNTAX is:

  '   Colour% = POINT(Xlocation,Ylocation)
  '                       or
  '   Print "The current color is";POINT(Xlocation,Ylocation)

  ' POINT returns the number of the pen used when the PIXEL
  ' was turned on.

  CLS
  LOCATE 1,1 : PRINT "This is printed in pen #1."
  PRINT "I will read PIXELs at 0,0 and then 4,2"
  PRINT "(Upper left corner a piece of the T)"
  PRINT "and return the values in Col1 and Col2"
  PRINT : PRINT "Col1 = POINT(0,0) : Col2 = POINT(4,2)"
  Col1 = POINT(0,0) : Col2 = POINT(4,2)
  FOR Delay = 1 TO 100 : NEXT Delay
  PRINT Col1;" is 0,0",Col2;" is 4,2"
  LOCATE 23,5 : PRINT "Click to Continue...";
  Driver

LineExample:

  ' We will now examine variations of the LINE function.
  ' LINE can be used to create lines, hollow boxes or filled
  ' boxes. The SYNTAX for LINE is:

  '        LINE(Xstart,Ystart)-(Xend,Yend)[,Color][,b[f]]

  ' When specified, the b flag tells the function to make a
  ' box, while the f flag (which can't be used without the b
  ' flag) will fill the box with either the specified Color,
  ' or the current foreground color if not specified.

  CLS : DIM Xend(20),Yend(20)
  LOCATE 23,5 : PRINT "Let's examine LINEs...";
  X = 155 : Y = 170
  FOR Count = 1 TO 20
    Xend(Count) = INT(RND * 250)
    Yend(Count) = INT(RND * 30)
  NEXT Count
  FOR Loop = 1 TO 20
    FOR Count = 1 TO 20
      Colour = INT(RND * 21) + 2
      LINE(X,Y)-(Xend(Count),Yend(Count)),Colour
    NEXT Count
  NEXT Loop
  LOCATE 23,5 : PRINT "Click to Continue..." + SPACE$(15);
  Driver
  ERASE Xend,Yend

  ' Now let's see some box and filled box examples

  CLS
  LOCATE 23,5 : PRINT "Here are what ,b and ,bf do...";
  FOR Count = 1 TO 250
    X = INT(RND * 260) : Xend = X + INT(RND * 60) + 2
    Y = INT(RND * 140) : Yend = Y + INT(RND * 30) + 4
    Colour = INT(RND * 13) + 2
    LINE(X,Y)-(Xend,Yend),Colour,bf
    LINE(X+1,Y+1)-(Xend-1,Yend-1),0,b
  NEXT
  WINDOW 3,"",(50,70)-(260,120),0,1
  COLOR 7,0
  PRINT
  PRINT "The SOLID  or FILLED Boxes"
  PRINT "were  created  with the bf"
  PRINT "option  while   the  black"
  PRINT "borders  were created with"
  PRINT "the b option alone."
  WINDOW OUTPUT 2
  COLOR 1,0
  LOCATE 23,5 : PRINT "Click to Continue..." + SPACE$(15);
  Driver
  WINDOW CLOSE 3

CircleExamples:
  ' With the use of one AmigaBASIC function, we can create
  ' circles, ellipses and arcs. The SYNTAX for this function
  ' is as follows:

  ' CIRCLE(XCenter,YCenter),radius
  ' [,Color[,ArcStart,ArcEnd][,aspect]]]

  ' XCenter, YCenter and radius are the only required values
  ' in the function. XCenter and YCenter are the X and Y
  ' coordinates of the center of the circle and the radius
  ' is the value in PIXELS for the distance between the
  ' center and the outside of the circle. Color is the
  ' palette number that you wish the circle to be drawn in.
  ' If not specified, the current foreground color is
  ' used. ArcStart, ArcEnd and aspect are explained after
  ' the following example of the CIRCLE function.

  CLS
  LOCATE 23,5 : PRINT "Let's look at CIRCLEs...";
  LINE(0,90)-(297,90),3
  YCenter = 90
  FOR XCenter = 0 TO 297 STEP 5
    CircleSin = 60 * SIN(6.28318 / 297 * XCenter)
    CIRCLE(XCenter,(YCenter + CircleSin)),20,INT(RND * 13)+1
  NEXT XCenter
  FOR Delay = 1 TO 3000 : NEXT Delay
  LOCATE 1,1 : COLOR 6,0
  PRINT "Sine function in Circles"
  LOCATE 23,5 : PRINT "Click to Continue..." + SPACE$(15);
  Driver

  ' The values used above for ArcStart, ArcEnd and aspect
  ' are used for drawing arcs and elipses. Most everyone
  ' knows what a circle is, but arcs and ellipses are a
  ' different story. An arc is a piece of a complete circle
  ' between two points. The points are specified in radians
  ' between 0 and 6.28318. When used with the CIRCLE
  ' function, 0 is located at 90 degrees and the arc travels
  ' counter-clockwise up to the 6.281318 value. A radian has
  ' a direct relationship to the arithematic value of PI.
  ' PI, rounded to 5 decimal places, is 3.14159 radians. A
  ' full circle is equal to 6.28318 radians, or 2 PI
  ' radians. Therefore, a half circle is equal to PI Radians
  ' and a quarter is 1/2 PI radians, or 1.57079 radians.  To
  ' determine the radian value for a given degree, we can
  ' use the following formula:
```

```
'     radians = (PI * Angle) / 180

' When figuring the relationship of the arc to the actual
' outside of the circle, we must add 90 to the arc size
' (in degrees) because of zero being at 90 degrees. For a
' 30 degree arc from 180 to 150 degrees (counterclockwise
' remember), we add 90 to 180 and, if the result is larger
' than 360, subtract 360. The result is 270, (we don't
' need to subtract 360). Using the formula above, we get
' (3.14159 * 270) / 180, or 4.712339 radians, as the
' ArcStart. A 30 degree arc would have (3.14159 * 30) /
' 180 OR .5236 radians. Therefore, we add .5236 to our
' ArcStart for a thirty degree arc.

CLS
CIRCLE(100,65),45,10
COLOR 4
CIRCLE(100,65),45,,4.712339,4.712339 + .5326
LINE(100,65)-(100,101) : LINE(100,65)-(124,97)
COLOR 5
LOCATE 15,12 : PRINT "A 30 degree arc"
LOCATE 16,12 : PRINT "Between 180 and 150"
COLOR 1
LOCATE 23,5 : PRINT "An ARC example...";
FOR Delay = 1 TO 4000 : NEXT Delay
LOCATE 23,5 : PRINT "Click to Continue...";
Driver

' An ellipse is a circle that has a varying radius. Some
' people refer to an ellipse as an oval, but an oval has
' two straight, parallel sides with two 180 degree arcs
' for ends. An ellipse has no straight sides and is
' created by specifying an aspect value in the CIRCLE
' function. The aspect is the ratio of height versus width
' of the radius of your circle. For our current screen, it
' is .88 pixels high for every pixel wide. On a 640x200
' screen, it would be .44 pixels high for each pixel wide.
' These values take into accoont the difference in the
' horizontal and vertical number of pixels as well as the
' pitch differences of the monitor you are using. In fact,
' AmigaBASIC assume that you are using an Amiga 1080
' monitor. If you aren't, you may have to adjust these to
' get round circles on your monitor.
' Here are a few aspect examples.

CLS
LOCATE 23,5 : PRINT "Ellipses made using aspect...";
CIRCLE(30,17),15,5,,,.25
CIRCLE(75,123),24,11,,,.47
CIRCLE(123,100),78,9,,,.88        ' this one should be round
CIRCLE(199,25),19,13,,,1
CIRCLE(260,123),46,2,,,1.35
FOR Delay = 1 TO 5000 : NEXT Delay
LOCATE 23,5 : PRINT "Click to continue...";SPACE$(10);
Driver

MultiSidedExamples:

' Multisided figures (other than rectangles or boxes) can
' be created through the use of the AREA and AREAFILL
' functions. AREA allows you to define a number of points
' that will be used to construct your figure and AREAFILL
' is used to connect the points to draw the figure. When
' using AREA, you can make life easier by using the STEP
' option. STEP allows you to position your points relative
' to a previous point rather than an absolute address.
' That way, if your initial point is set by a set of
' variables, your shape will remain constant. Also, the
' STEP option may be used, as shown in the SYNTAX
' listings, with other graphics commands to get similar
' results. The SYNTAX for these functions is:
'
'       AREA [STEP](Xloc,Yloc)
'       AREAFILL [mode]

' When you create a set of points with AREA, areafill will
' automatically connect the last point listed with the
' first point listed. If the mode portion of the AREAFILL
' is not used, the color is set to the current foreground
' color. If mode = 1 then the area is filled with the
' inverse of the foreground color, which is equal to its
' opposite in the current palette list. In a 4 bitplane
' screen, this means that color 0 is inversed to color 15,
' color 1 is color 14, and so on.  If mode = 0 then the
' area is filled with the currently defined PATTERN (to be
' described below).

CLS
LOCATE 23,5 : PRINT "AREA & AREFILL for polygons...";
AREA(130,23)
AREA STEP(-40,20)
AREA STEP(0,20)
AREA STEP(40,20)
AREA STEP(40,-20)
AREA STEP(0,-20)
COLOR 5 : AREAFILL                        ' no mode specified!
FOR Delay = 1 TO 5000 : NEXT Delay
LOCATE 23,5 : PRINT "Click to continue...";SPACE$(10);
CLEAR
Driver

PatternExample:

' If you have ever seen Images, from Aegis, you have seen
' a good use of patterns in graphics. AmigaBASIC also
' gives you the power of patterns through the PATTERN
' function.  The SYNTAX for PATTERN is:
'
'     PATTERN linemask, fillmask array

' The linemask is a sixteen bit pattern that defines the
' pattern with which lines will be drawn. By defining the
' bit pattern and then changing the binary value to
' hexadecimal, any lines drawn in the future will be
' rendered using the specified pattern. If we want a
' dashed line, we could use 1100110011001100 ($CCCC hex),
' as the linemask.  Here's a quick example:

CLS
PATTERN &HCCCC
LINE(12,12)-(300,12),7
LINE(12,45)-(300,50),2,b
LOCATE 4,12 : PRINT "PATTERN &HCCCC"
LOCATE 23,5 : PRINT "Click to continue...";
CLEAR
Driver

' The fillmask is an array containing a number of 16 bit
' linemasks. The only consideration is that you select a
' power of 2 for the number of entries in the array (2, 4,
' 8, 16, etc.). Let's take a look at a short program that
' defines and displays a box full of zig-zag:

LOCATE 23,5 : PRINT SPACE$(25);
DIM ZigZag%(3)      ' remember, we start counting at 0, so
                    ' 3 is 4 items.
ZigZag%(0) = &HF0F0
ZigZag%(1) = &H3C3C
ZigZag%(2) = &HF0F
ZigZag%(3) = &H3C3C
PATTERN, ZigZag%
LINE(12,100)-(300,130),13,bf
LOCATE 20,12 : PRINT "PATTERN, ZigZag%"
LOCATE 23,5 : PRINT "Click to Continue...";
Driver

' Usually, you will use PATTERN with either the linemask
' or the fillmask specified, but not both. Once you are
' finished with your pattern work, you may return to the
' default solids with:

PATTERN &HFFFF              'for the linemask and
DIM solid%(1)
  solid%(0) = &HFFFF
  solid%(1) = &HFFFF        'for fillmask
PATTERN, solid%
ERASE ZigZag% : ERASE solid%

PaintExample:

' There is one final function that may be used to fill an
' area: PAINT. PAINT is used to flood-fill any shape not
' covered by the ,bf option in LINE and AREAFILL, such as
' CIRCLES and irregular shapes that may have been created
' while folowing the MOUSE with PSET. SYNTAX for PAINT is:
'
'        PAINT(Xloc,Yloc)[,fillcolor][,bordercolor]

' The fillcolor, if specified, is the color with which the
' shape will be PAINTed. If fillcolor is specified, and is
' other than the current foreground color, bordercolor
' MUST be specified and MUST be the color of the border
' into which you wish to PAINT. If bordercolor is not
' specified, and the fillcolor is other than the border
' color of the shape to be filled, the border will be
' ignored and you will PAINT the entire WINDOW! Keep in
' mind that you must use a SMART REFRESH window (WINDOW
' type 16 or greater). WINDOW types are described in
' installment one of this series. The example below
' demonstrates PAINT:

CLS
CIRCLE(150,100),68
PAINT(100,100)
CIRCLE(200,125),34,6
PAINT(200,125),3,6

' Here comes the BOMB...

LOCATE 23,5 : PRINT "This one bombs out...";
CIRCLE(40,145),15,7
LOCATE 1,1 : PRINT "We'll use a bad bordercolor"
FOR Delay = 1 TO 3000 : NEXT Delay
PAINT(40,145),11,14
LOCATE 23,1 : PRINT SPACE$(35);
LOCATE 23,5 : PRINT "Click to Continue...";
Driver

ProgramEnd:

WINDOW CLOSE 2
SCREEN CLOSE 1
WINDOW 1,"Static Graphics",,31,-1
END

SUB Driver STATIC    ' Sub Programs will be covered
                     ' in a future installment
  WHILE MOUSE(0) = 0 : WEND
  WHILE MOUSE(0) <> 0 : WEND
END SUB
```

END

BY KEVIN DEWEY

Mister Mailman
for the Commodore 64

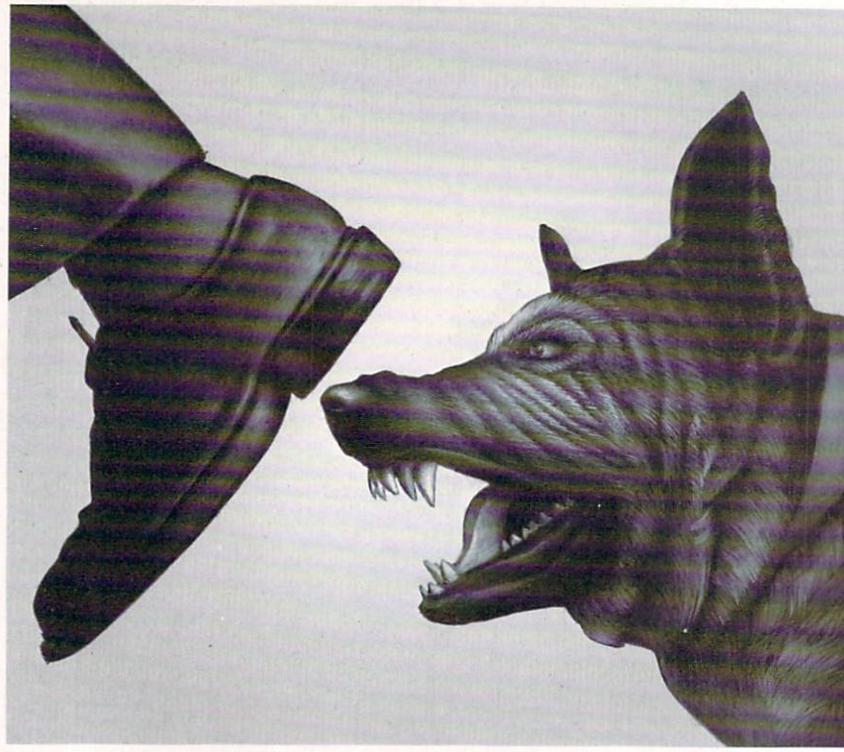
Neither rain nor sleet nor wind nor hail will keep Mister Mailman from delivering the mail. Mister Mailman is the United States Postal Service's best man. In 1984 he was awarded the prestigious Mailman of the Year award. He has never missed a day or let anything stop him from getting the mail through. But now, that may all change.

It seems our hero has been reassigned. A re-assignment isn't usually bad news. Most mailmen like having a new neighborhood to deliver to. The same neighborhood year after year can get pretty boring, and a new neighborhood is a nice change of pace—unless the neighborhood has blood-thirsty hounds in it.

The Greenfield Estates are a nice place to live. They are not a nice place to deliver mail. There are a lot of dogs there, and they go crazy when they see a mailman. Over the past three years, many mailmen have been seriously injured trying to deliver mail there. The word got around. Soon, there wasn't a mailman in the country who would even attempt to deliver there, with one exception—Mister Mailman.

In this game you assume the role of Mister Mailman. Your objective is to deliver mail while eluding two unfriendly dogs. There are only two streets that you deliver to in the Greenfield Estates, each with three houses. You must deliver first to one street, than the other. By the time you're done with the second street, it's time to deliver to the first again. The game is played only on these two streets, but it has eight different levels.

The only difference between levels is that there are different dogs on each level. These dogs have different characteristics. Some are dumb, some are smart, some are fast, some are slow, some are big, some are small, some stay by the mailboxes and some don't, and some are even hard to see. They all have one thing in common, though— they are after you.



The Greenfield Estates are a nice place to live. They are not a nice place to deliver mail. There are a lot of dogs there, and they go crazy when they see a mailman.

Delivering Mail

You control your man with the joystick in port 1. You can move him in all directions. To deliver mail, move your man up to a mailbox and press straight up; not horizontal, but straight. If you are in the right place, there will be a sound to signify you have delivered the mail and the box will turn red. If you press up and nothing happens, move right or left a step and try again. Each mailbox has its own special place you have to be in to deliver the mail. Finding the place is easy, and after you've played the game a few times you will know where it is.

Do not deliver mail twice to the same mailbox. If you do, you will turn red and die of embarrassment, losing a life. However, after losing a life, you must re-deliver to all three mailboxes on the screen, even if you have already delivered to them, because your mail goes to that great mailbox in the sky with you when you die. You have five lives.

After delivering to all three mailboxes, you will progress to the next screen.

Eluding Dogs

There are some things you should know about the dogs that will be after you.

If the dogs touch you in any way, you lose a life.

One of the dogs is very smart. If you move up, he moves up. If you move down, he moves down. However, he is slow, so it is possible to evade him.

The other dog isn't all that smart. He doesn't really go after you, he stays up by the mailboxes usually. He is very fast and it is wise to stay away from him and deliver to the box he isn't near.

Once in a while the fast dog will go down the street away from the mailboxes, but not often.

You will, on most screens, not be able to dodge the smart dog with a little side step. It is a good idea to go all the way to the bottom or top of the screen and give yourself plenty of room to dodge him. He can't move up and down as fast as you, so after a while you will get out of his reach and he will pass you up.

The dogs always move from right to left across the screen and they never turn around.

The dogs never break their stride.

The dogs have different traits on each screen.

No matter what kind of dogs inhabit the playing area, there is always one dumb dog and one smart dog. It is easy to tell them apart.

Basically, dodging the dogs isn't an easy thing to do, but don't get frustrated. After you've played the game a few times, it gets easier.

The Screens

Here is a brief description of each screen.

Screen 1: In this screen everything is pretty normal. The smart dog is smart but not extremely fast, and the dumb dog stays near the top of the screen, for the most part.

Screen 2: The smart dog gets fast in this screen, so concentrate on going around him. The dumb dog gets faster, too.

Screen 3: In this screen the dumb dog will show less of a tendency to stay up by the mailboxes, and the smart dog gets even faster. Go way out of your way to dodge him. It may be tough.

Screen 4: In this screen the dogs are brand new. They are french poodles. They are longer than the other dogs, making them harder to dodge. The smart one slows down to almost a crawl to make things easier.

Screen 5: Now you encounter german shepherds. They are big, but slow.

Screen 6: Now the dogs are back to normal size. The dumb one on this screen has pretty much abandoned the mailboxes. He goes all over the screen. The smart one is really slow.

Screen 7: Now the dumb dog is black, making him impossible to see on the street. He usually hangs around the mailboxes though, and you can see him against the white sidewalk. When you can't see him, try to get near the bottom of the screen. You should be safe there. In this screen, the smart dog is extremely fast, but can't move up and down that well. He is very easy to dodge.

Screen 8: In this screen there is still a black dog to complicate things, but the dogs have pretty much given up on catching you. They move at a snail's pace. If you pass this screen you get a hefty bonus and start over from the beginning.

Now that you've had a brief description of each screen, you should be ready to go. Remember, the screens don't get harder as you go up. They just change a lot. So don't think that just because you can't get through the first few screens you won't be able to pass the next ones. You may find them easier. It all depends on how you play the game.

You can pause the game by either pressing the fire button or the shift key. When in a tough spot, you may want to hold down the fire button and review your options.

If you don't want to start at the first screen, change the value of KJ in line 29 to 3, 5 or 7. This will start you at screens 3, 5, or 7, respectively. In the first screen the dogs will act like they always do in the first screen, regardless of size or appearance, but from then or everything will be how it should be.

Have fun playing Mister Mailman. ■

Before typing these programs, read "How to Enter Programs," and "How to Use the Magazine Entry Program." The BASIC programs in this magazine are available on disk from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007, 1-800-831-2694.

Mister Mailman

```
0 Y=.:GOTO 5000'CHRA
3 IF B<225 AND A>25 THEN A=A-5:B=B+5
  :GOTO 41'KRHL
5 IF A>25 THEN A=A-5:GOTO 41'GJXI
6 IF B>150 AND A>25 THEN B=B-5:A=A-5
  :GOTO 41'KRDO
7 IF A<225 AND B<225 THEN A=A+5:B=B+5
  :GOTO 41'KSIP
8 IF A<250 THEN A=A+5:GOTO 41'GKWL
9 IF A<250 AND B>150 THEN A=A+5:B=B-5
  :GOTO 41'KSCR
10 IF B>150 THEN B=B-5:GOTO 41'GKXC
11 IF A=40 OR A=115 OR A=215 THEN
   1100'HPQF
12 IF B<225 THEN B=B+5:GOTO 41'GKCE
13 GOTO 41'BCMA
17 POKE V+21,33:GOTO 64'DJJH
18 POKE V+21,34:GOTO 64'DJKI
25 Q=9:IF F<255 THEN F=F+6
   :GOTO 48'HNMK
26 GOTO 48'BCTE
27 Q=9:IF F>154 THEN F=F-6
   :GOTO 48'HNJM
28 GOTO 48'BCTG
29 X=5:K=1:RR=4:W=8:Z=3:KJ=1:EE=3'HXKR
30 IF KJ=1 OR KJ=3 OR KJ=5 OR KJ=7
   THEN GOSUB 6000'KQDJ
31 A=25:B=200:C=0:POKE V+23,0
   :POKE V+29,0:E=170:F=B:G=B:H=B:R=0
   :POKE V+42,9'OVMT
32 I=250:J=I:FOR T=54272 TO 54296
   :POKE T,0:NEXT:POKE 54277,100
   :POKE 54296,15'JSVP
33 S=54272:POKE S+6,20:POKE S+5,2
   :POKE V+30,0:POKE V+37,10:D=56321
   :POKE S+4,129'MTDT
34 O=187:PRINT"[HOME,BLACK,RVOFF]
   SCORE ";Y;"[SPACE2]MAILMEN ";X
   :POKE V+21,255:POKE 2040,192'FCOR
35 IF KJ=4 THEN POKE V+29,254'FKRJ
36 IF KJ=5 THEN POKE V+23,254
   :POKE V+29,254'HSPN
37 IF KJ=6 THEN POKE V+29,224
   :POKE V+23,0:F=160'IVHP
38 IF KJ=7 THEN POKE V+44,0:F=150'GNKN
40 AA=A:VJ=VJ+1:ON NOT PEEK(D)AND 15
   GOTO 10,12,1,5,6,3,1,8,9,7'ILTM
41 POKE S+1,3:POKE S,O'DITE
44 POKE V+30,.:POKE V+6,I:POKE V+10,J
   :POKE V+7,E:POKE V+11,F
   :IF J<12 THEN J=J+240'PLGV
45 POKE S,.:POKE S+1,.:I=I-RR
   :IF B<E THEN E=E-EE'KUDQ
46 Q=INT(RND(1)*Z)+1:J=J-W
   :IF B>E THEN E=E+EE'MTNS
48 ON Q GOTO 25,27,27,27:WAIT 653,1,1
   :IF I<10 THEN I=I+240'IECT
```

```
51 N=PEEK(V+30):IF(N AND 1)=1 AND
   VJ>9 THEN 1200'JTNM
52 IF AA>A THEN POKE 2040,193'ELDH
53 IF AA<A THEN POKE 2040,192'ELEI
54 POKE V+0,A:POKE V+1,B:GOTO 40'FMCK
60 VL=.:KJ=KJ+1:IF KJ=2 THEN RR=6:W=10
   :Z=5:GOSUB 6102'KDVP
61 IF KJ=3 THEN RR=8:W=6:Z=6'GMVK
62 IF KJ=4 THEN RR=2:W=8
   :GOSUB 6102'GONL
63 IF KJ=5 THEN RR=2'EGDJ
64 IF KJ=6 THEN Z=100:GOSUB 6102'FMTL
65 IF KJ=7 THEN EE=1:RR=12'FLQN
66 IF KJ=8 THEN RR=1:W=1:EE=1
   :GOSUB 6102'HSBQ
67 IF KJ=9 THEN 80'DFAM
70 GOTO 30'BCKD
80 PRINT"[HOME,DOWN2]8 SCREEN
   BONUS!!!"'BABI
90 JV=1:POKE S+1,37:POKE S,42
   :GOSUB 1960:KJ=1:GOTO 29'HBSP
999 STOP'BASV
1100 Y=Y+KJ*100:FOR T=54272 TO 54296
     :POKE T,0:NEXT'IYSE
1101 IF A=40 THEN PRINT"[HOME,DOWN13,
     RIGHT3,RED,RVS] [RVOFF]";'EEHA
1102 IF A=115 THEN PRINT"[HOME,DOWN13,
     RIGHT12,RED,RVS] ";'EFQC
1103 IF A=215 THEN PRINT"[HOME,DOWN13,
     RIGHT25,RVS,RED] ";'EFNE
1104 PRINT"[HOME,BLACK,RVOFF]SCORE ";
     Y;"[SPACE3]MAILMEN ";X'BFRF
1105 S=54272:POKE 54296,15
     :POKE S+5,200:POKE S+6,100
     :POKE S+1,35:POKE S,3'JOON
1106 POKE S+4,33:FOR T=1 TO 100:NEXT
     :POKE S+4,129'ITHJ
1107 FOR T=1 TO 30:NEXT:POKE S,0
     :POKE S+1,0:VL=VL+A'JUML
1108 IF VL=370 THEN 1900'DJIF
1110 IF VL<>40 AND VL<>115 AND
     VL<>215 AND VL<>155 AND VL<>255
     AND VL<>330 THEN 1190'TIKP
1120 POKE 54296,9:GOTO 41'CKUY
1190 POKE V+37,2'CFTF
1200 VJ=0:FOR L=54272 TO 54296
     :POKE L,0:NEXT'GUID
1203 FOR T=19 TO 16 STEP-1
     :POKE S+6,100:POKE S+5,100
     :POKE 2040,192'KEVK
1204 POKE S+24,15:IF TL=17 THEN
     TL=195'GQMG
1205 IF TL=16 THEN TL=195'EJTE
1206 POKE S+24,15:IF T=19 THEN
     TL=239'GPMI
1207 POKE S+4,17:IF T=18 THEN
     TL=209'GOKJ
1210 POKE S+1,T:POKE S,TL
     :FOR TT=1 TO 50:NEXT:POKE S,0
     :POKE S+1,0:FOR TT=1 TO 30'NGDL
1215 NEXT:POKE 2040,193:POKE S+6,100
     :POKE S+5,100:POKE S+1,39
     :POKE S,223'JKYN
1220 FOR TT=1 TO 50:NEXT:POKE S,0
     :POKE S+1,0:FOR TT=1 TO 30:NEXT
     :NEXT:VL=0'NCVL
1250 REM OOPS!'BFPB
1255 POKE 2040,194:POKE S+1,4
     :POKE S,48:POKE S+4,33
     :FOR TT=1 TO 50:NEXT'KGYR
1260 POKE S+1,0:POKE S,0:X=X-1
     :FOR TT=1 TO 500:NEXT
     :IF X=0 THEN 1300'MCOO
1261 GOTO 1500'BEDD
1262 PRINT"[HOME,BLACK]SCORE ";Y;"
     [SPACE3]MAILMEN ";X'BFBJ
1265 POKE V+21,0:ON KJ GOTO 30,55'ENFL
1300 PRINT"[HOME,SPACE17]GAME[SPACE2,
     DOWN,LEFT6]OVER"'BAVF
1310 FOR T=1 TO 1200:NEXT
     :PRINT"[CLEAR]":PRINT"[BLACK]
     FINAL SCORE=";Y'GLKH
1320 PRINT"[DOWN2] YOU MADE IT TO
     SCREEN";KJ'BDEF
1330 PRINT"[DOWN3] TYPE RUN TO PLAY
     AGAIN."'BADG
1335 POKE V+21,0:FOR T=1 TO 100:GET A$
     :NEXT'HPUL
1340 END'BACA
1500 VJ=.:JV=1:FOR T=S TO S+24
     :POKE T,0:NEXT'ISXH
1505 POKE S+24,9:POKE S+5,1
     :POKE S+6,255:FOR T=1 TO 4
     :POKE S+1,71'LCGP
1510 POKE S,12:POKE S+4,33:POKE S+1,1
     :POKE S,12:POKE S+4,128
     :FOR TT=1 TO 50:NEXT'MJON
1515 IF T<3 THEN I=I-2:J=J-2
     :POKE V+6,I:POKE V+10,J
     :POKE V+7,E:POKE V+11,F'PGSV
1517 IF T>2 THEN I=I+2:J=J+2
     :POKE V+6,I:POKE V+10,J
     :POKE V+7,E:POKE V+11,F'PGNX
1520 POKE S+1,.:POKE S,.
     :TR=INT(RND(1)*5)*100
     :FOR TL=1 TO TR:NEXT:NEXT'NDSO
1530 GOTO 30'BCKB
1900 ON KJ GOTO 1905,2000,1905,2000,
     1905,2000,1905,2000,1905,2000,
     1905,2000'CLXO
1905 RESTORE:POKE S+24,15:POKE S+5,100
     :POKE S+6,100:FOR T=1 TO 9
     :READ TT,TU,TV'LJGV
1910 POKE S,TT:POKE S+1,TU:POKE S+4,17
     :FOR TW=1 TO TV:NEXT
     :POKE S+4,33'LEPR
1912 FOR TW=1 TO TV:NEXT:POKE S+1,.
     :POKE S,.:NEXT'IQVN
1913 FOR L=54272 TO 54296:POKE L,0
     :NEXT:POKE S+24,15'HXSP
1915 POKE S+5,25:POKE S+6,255'EMON
1920 FOR T=1 TO 5:POKE S+1,106
     :POKE S,115:POKE S+4,17'IWHN
1922 FOR TT=1 TO 100:NEXT:POKE S+1,.
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     :POKE S,.'HQLN
1925 FOR TT=1 TO 99:NEXT:Y=Y+KJ*50
     :PRINT"[HOME,BLACK]SCORE ";Y
     :FOR TR=1 TO 150:NEXT:NEXT'NAJA
1930 IF VJ<150 AND JV=0 THEN 1950'FMBL
1940 JV=.:GOTO 60'CGSI
1950 FOR T=1 TO 300:NEXT
     :PRINT"[DOWN2]TIME BONUS!!!"
     :POKE S+1,238:POKE S,248'IUBT
1960 POKE S+5,200:POKE S+6,200
     :POKE S+4,33:FOR T=1 TO 600:NEXT
     :POKE S+1,0:YY=Y'NKXY
1970 FOR T=1 TO YY+200-VJ:Y=Y+1
     :PRINT"[HOME,BLACK]SCORE ";Y:NEXT
     :FOR T=1 TO 300:NEXT:JV=.'ODVC
1975 IF KJ=9 THEN RETURN'EDNR
1980 GOTO 60'BCNK
1990 S=54272'BGJN
2000 RESTORE:FOR T=1 TO 9
     :READ TT,TU,TV:NEXT'GORB
2005 FOR L=S TO S+24:POKE L,0:NEXT
     :POKE S+24,15:POKE S+5,100
     :POKE S+6,100'MGJN
2010 FOR T=1 TO 5:READ TT,TU,TV
     :POKE S+1,TT:POKE S,TU'HXMF
2012 FOR TL=1 TO TV:POKE S+4,33
     :NEXT'GMLD
2015 FOR TL=1 TO 20:POKE S+4,17
     :NEXT'GMQG
2020 NEXT:POKE S,.:POKE S+1,.'EJNA
2040 GOTO 60'BCNX
3050 FOR T=1 TO 99999:NEXT'EICE
3999 STOP'BASW
4172 POKE V+21,0'CFKI
4999 STOP'BASX
5000 REM TITLE SCREEN STUFF'BQNC
5005 TT=192:FOR T=2040 TO 2047
     :POKE T,TT:TT=TT+1:NEXT'ICKN
5007 RESTORE:FOR J=1 TO 42:READ X
     :NEXT'GIHJ
5010 V=53248:POKE 2040,192
     :POKE 2041,193:FOR J=12288 TO
     12734'GLVJ
5012 READ X:POKE J,X:NEXT
     :FOR T=42 TO 45:POKE V+T,9
     :NEXT'JSEJ
5015 POKE V+21,31:POKE V+39,6
     :POKE V+40,6:POKE V+41,6
     :POKE V+28,7'KFUP
5017 POKE V+37,10:POKE V+38,9
     :FOR J=12288 TO 12478:READ X
     :POKE J,X:NEXT:GOTO 29'LJET
6000 POKE 53265,11:POKE 53281,14
     :POKE 53280,2:PRINT"[CLEAR]"
     :POKE V+21,0'GHHI
6003 PRINT"[CLEAR,RIGHT26,GRAY3,RVS,
     SHFT POUND,CMDR *]"'BALH
6005 PRINT"[RIGHT22,RED,RVS]
     :[RIGHT2,GRAY3,SHFT POUND,SPACE2,
     CMDR *]"'BAGJ
6010 PRINT"[RIGHT4,BROWN,RVS,
     SHFT POUND,CMDR *,RIGHT16,RED]
     :[RIGHT,GRAY3,SHFT POUND,SPACE4,
     CMDR *]"'BAPH
6020 PRINT"[BROWN,RIGHT3,RVS,
     SHFT POUND,SPACE2,CMDR *,RIGHT3,
     RVOFF,SHFT M,RVS,RIGHT11,RED]
     :[GRAY3,SHFT POUND,SPACE6,CMDR *]
     "'BARJ
6025 PRINT"[BROWN,RIGHT2,RVS,
     SHFT POUND,SPACE4,CMDR *,RIGHT2,
     RVOFF,SHFT Y,SHFT N,RVS,RIGHT10,
     RED]::[GRAY3,SPACE7,CMDR *]"'BADP
6030 PRINT"[BROWN,RIGHT,RVS,
     SHFT POUND,SPACE6,CMDR *,RIGHT,
     RVOFF,SHFT Y,RIGHT11,RVS,RED]:
     :[WHITE,SPACE7]"'BAYI
6035 PRINT"[BROWN,RVS,SHFT POUND,
     SPACE8,CMDR *,RVOFF,SHFT Y,
     SHFT N,RIGHT,RVS,GRAY1,
     SHFT POUND,SPACE3,CMDR *,RED]
     :[RIGHT,RVOFF,BROWN,SHFT M,
     SHFT T,RED,RVS]::[WHITE] [BLUE,
     SPACE2,WHITE,SPACE4]"'BAOT
6040 PRINT"[BROWN,RIGHT,RVS,ORANGE,
     SPACE8,RVOFF,RIGHT,BROWN,SHFT Y,
     RIGHT,RVS,GRAY1,SHFT POUND,
     SPACE5,RED]:[RVOFF,RIGHT2,SHFT T,
     RVS,RED]::[WHITE,SHFT *7]"'BAYQ
6050 PRINT"[RVS,GREEN] [ORANGE] [BLUE]
      [ORANGE,SPACE2,BLUE] [ORANGE,
     SPACE3,GREEN,SPACE3,GRAY1,SPACE7,
     GREEN,SPACE3,RED]:
     :[WHITE,SPACE4,BLUE,SPACE2,WHITE]
      [GREEN,SPACE9]";'BBCM
6065 PRINT"[RVS] [GREEN,ORANGE,
     SHFT *8,GREEN,SPACE4,PURPLE,
     SPACE5,GREEN,SPACE4,RED]:
     :[WHITE,SHFT *7,GREEN,SPACE8]";
     'BBJB
6070 PRINT"[RVS] [GREEN] [ORANGE,
     SPACE5,BROWN] [ORANGE,SPACE2,
     GREEN,SPACE4,PURPLE,SPACE2,GRAY3]
     .[PURPLE,SPACE2,GREEN,SPACE4,RED]
     ::[WHITE,SPACE5,GRAY1] [WHITE]
     [GREEN,SPACE8]";'BBIP
6080 PRINT"[RVS] [GREEN] [ORANGE,
     SPACE5,BROWN]'[ORANGE,SPACE2,
     GREEN,SPACE4,PURPLE,SPACE2,GRAY3]
      [PURPLE,SPACE2,GREEN,SPACE4,RED]
     ::[WHITE,SPACE5,GRAY1]'[WHITE]
     [GREEN,SPACE7]";'BBCQ
6085 PRINT"[RVS,GREEN,SPACE40]";'BBER
6087 PRINT"[RVS,GREEN,SPACE5,BLUE]
     [GREEN,SPACE8,PURPLE] [GREEN,
     SPACE12,WHITE] [GREEN,SPACE14]";
     'BBTU
6090 PRINT"[RVS,GRAY3,SPACE3]I[SPACE8]
     I[SPACE12]I[SPACE14]";'BBAO
6092 FOR T=1 TO 8:PRINT"[BLACK,RVS,
     SPACE40]";:NEXT'FGBT
6095 PRINT"[GRAY3,RVS,SPACE40]";'BBES
6096 PRINT"[GRAY3,RVS,SPACE39]";'BBWT
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6097 POKE 2023,160:POKE 56295,2
     :PRINT"[HOME]";'DSXT
6098 FOR T=1 TO 24:PRINT"[RIGHT32,RVS,
     RED,SPACE8]";'EGHX
6099 NEXT:PRINT"[RIGHT32,RVS,SPACE7]";
     'CCIW
6101 POKE 53265,27:RETURN'CJXC
6102 POKE 53281,14:POKE 53280,6
     :POKE 53265,11'DAUH
6105 PRINT"[CLEAR,DOWN3,RIGHT5,GRAY3,
     RVS,SHFT POUND,CMDR *]"'BAPI
6110 PRINT"[RIGHT5,GRAY3,RVS,SPACE2,
     RIGHT8,GRAY1,SPACE2,RIGHT6,
     PURPLE,SHFT POUND,SPACE3,CMDR *]
     "'BANH
6115 PRINT"[RIGHT4,RVS,GRAY3,
     SHFT POUND,SPACE2,CMDR *,RIGHT6,
     GRAY1,SHFT POUND,SPACE2,CMDR *,
     RIGHT4,PURPLE,SHFT POUND,SPACE5,
     CMDR *]"'BAHO
6120 PRINT"[RIGHT4,GRAY3,RVS,SPACE4,
     RIGHT5,RVS,GRAY1,SHFT POUND,
     SPACE4,CMDR *,RIGHT,PURPLE,RIGHT,
     SHFT POUND,SPACE7,CMDR *]"'BARJ
6125 PRINT"[RIGHT2,GRAY3,RVS,
     SHFT POUND,SPACE6,CMDR *,RIGHT4,
     L. GREEN,SPACE4,RIGHT3,PURPLE,
     SPACE9]"'BAIN
6130 PRINT"[RVS,RIGHT,RED,SHFT POUND,
     SPACE8,CMDR *,RIGHT3,L. GREEN]
     [GRAY1,SPACE2,L. GREEN] [RIGHT3,
     YELLOW,SPACE9]"'BANK
6135 PRINT"[RVS,GREEN,CMDR Y,RED,
     SPACE2,BLUE,SPACE2,RED,SPACE6,
     GREEN,CMDR U,CMDR Y,CMDR T,
     SPACE4,CMDR T,CMDR Y,CMDR U,
     YELLOW] [BLUE] [YELLOW] [BLUE]
     [YELLOW] [BLUE] [YELLOW] [BLUE]
     [YELLOW] [GREEN,CMDR U,CMDR Y,
     CMDR T,SPACE7]";'BBDW
6140 PRINT"[RVS,GREEN] [RED,SPACE6,
     GRAY1,CMDR +2,RED,SPACE2,GREEN,
     SPACE7,GREEN,SPACE3,YELLOW]
     [BLUE] [YELLOW] [BLUE] [YELLOW]
     [BLUE] [YELLOW] [BLUE] [YELLOW]
     [GREEN,SPACE10]";'BBKO
6145 PRINT"[RVS,GREEN] [RED,SPACE6,
     GRAY1,CMDR +2,RED,SPACE2,GREEN,
     SPACE7,GREEN,SPACE3,YELLOW,
     SHFT E4,GRAY1].[YELLOW,SHFT E4,
     GREEN,SPACE10]";'BBFX
6150 PRINT"[RVS,GREEN,SPACE38]";'BBUJ
6155 PRINT"[RVS,GREEN,SPACE5,BLUE]
     [GREEN,SPACE8,PURPLE] [GREEN,
     SPACE12,WHITE] [GREEN,SPACE14]";
     'BBTQ
6160 PRINT"[RVS,GRAY3,SPACE3]I[SPACE8
     I[SPACE12]I[SPACE12]";'BBQL
6175 FOR T=1 TO 399:PRINT"[BLACK,RVS]
     ";:NEXT:POKE 2023,160
     :POKE 56295,6'HANV
6177 PRINT"[HOME,DOWN23,RVS,GRAY3]
     "+SPC(40);'DEXR
6178 PRINT"[SPACE34]";:PRINT"[HOME]";
     'CDCU
6180 FOR T=1 TO 24:PRINT"[RIGHT32,RVS
     BLUE,SPACE8]";'EGKP
6185 NEXT:PRINT"[RIGHT32,RVS,BLUE,
     SPACE7]";'CCOS
6190 POKE 53265,27:POKE V+23,248
     :POKE V+29,248'FYEQ
6196 RETURN'BAQO
6200 POKE 53280,14:POKE 53281,4
     :POKE 53265,11'DASG
6202 V=53248:RESTORE:FOR T=1 TO 685
     :READ TT:NEXT'HRYK
6203 POKE 2043,220:POKE 2044,221
     :POKE 2045,222'DBRJ
6205 FOR T=14080 TO 14270:READ TT
     :POKE T,TT:NEXT'GURN
6207 POKE V+28,255:POKE V+42,2
     :POKE V+43,2:POKE V+44,2
     :POKE V+45,2'KGJU
6209 FOR T=14080 TO 14142:READ TT
     :POKE T,TT:NEXT'GUPR
6217 POKE V+42,1:POKE V+6,255
     :POKE V+7,100:POKE V+8,100
     :POKE V+9,150'KICV
6218 POKE V+10,50:POKE V+11,100
     :POKE V+44,1:POKE V+21,255'IDLU
9999 STOP'BASD
10000 DATA 195,16,75,209,18,75,31,21,
      100,60,50,75,99,56,75,195,16,75,
      75'BKAD
10001 DATA 63,120,30,25,125,60,50,400,
      31,165,100,29,223,120,31,165,
      100,29'BMCE
10002 DATA 223,100,21,31,400'BRGV
10007 DATA 0,60,0,0,60,0,0,63,0,0,60,
      0,0,63,0,0,60,0,0,60,0,0,48,0,3,
      255'BLRD
10008 DATA 0,15,255,192,12,252,248,12,
      252,56,12,252,0,12,252,0,252,
      252,0'BLKF
10010 DATA 204,198,0,204,198,0,252,
      198,0,252,198,0,48,198,0,3,199,
      0,0'BIFD
10015 DATA 0,240,0,0,240,0,3,240,0,0,
      240,0,3,240,0,0,240,0,0,240,0,0,
      48,0'BMDD
10020 DATA 3,255,0,15,255,192,124,252,
      192,112,252,192,0,252,192,0,252,
      192,0'BOXF
10025 DATA 252,252,0,252,204,0,204,
      204,0,204,252,0,204,252,0,204,
      48,3,207'BMRE
10027 DATA 0,0,0,0,0,0,0,0,0,0,0,0,
      0,0,0,48,0,0'BNCB
10030 DATA 252,0,0,252,7,60,204,7,60,
      204,1,140,252,1,143,252,40,195,
      240,40'BNYA
10035 DATA 195,240,254,255,48,254,255,
      48,255,255,112,255,255,112,0,
      255,192'BNOF
10037 DATA 0,255,192,255,192,0,255,
      192,0'BEBB
10038 DATA 0,0'BDPD
10040 DATA 0,0,0,0,0,0,0,0,0,0,0,0,
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        0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
        15,192'BODB
10041 DATA 0,15,195,0,255,195,204,15,
        255,204,3,63,252,0,15,240,0,15,
        240,0'BMGC
10042 DATA 12,48,0,12,48,0,12,48,0,0,
        0,0,0,0'BIVD
10043 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
        0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
        15,192'BMRD
10044 DATA 0,15,195,0,255,195,204,15,
        255,204,3,63,252,0,15,240,0,15,
        240,0'BMGF
10045 DATA 12,48,0,12,48,0,12,48,0,0,
        0'BCBF
10046 DATA 0,0'BDPC
10047 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
        0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
        15,192'BODI
10048 DATA 0,15,195,0,255,195,204,15,
        255,204,3,63,252,0,15,240,0,15,
        240,0'BMGJ
10049 DATA 12,48,0,48,12,0,192,3,0,0,
        0,0,0,0'BIVE
10050 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
        0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,
        15,192'BMRB
10051 DATA 0,15,195,0,255,195,204,15,
        255,204,3,63,252,0,15,240,0,15,
        240,0'BMGD
10052 DATA 12,48,0,12,48,0,12,48,0,0,
        0,0,40,0,0,40'BODF
10053 DATA 0,0,42,0,0,20,0,0,29,0,0,
        20,0,0,20,0,0,16,0,2,170,0,10,
        170,128'BMEE
10054 DATA 8,168,164,8,168,36,8,168,0,
        4,252,0,252,252,0,204,204,0,204,
        204,0'BOTG
10055 DATA 252,204,0,252,204,0,48,204,
        0,2,138,0'BLJC
10057 DATA 0,0,160,0,0'BLMF
10060 DATA 160,0,2,160,0,0,80,0,1,208,
        0,0,80,0,0,80,0,0,16,0,2,170,0,
        10'BKVC
10065 DATA 170,128,104,168,128,96,168,
        128,0,168,128,0,252,64,0,252,
        252'BJLH
10070 DATA 0,252,204,0,204,204,0,204,
        252,0,204,252,0,204,48,2,138,0,
        0'BIPD
10072 DATA 0,0,0,0,0,0,0,0,0,0,0,0,0,
        0,48'BFVF
10075 DATA 0,0,252,0,0,252,6,40,204,6,
        40,204,2,12,252,2,143,252,0,131,
        160'BMYJ
10080 DATA 8,131,160,180,171,48,180,
        171,48,149,171,48,149,171,240,
        0'BGLE
10085 DATA 171,192,0,171,192,106,128,
        0,106,128,0'BMCF
```

END

USER GROUPS

Although there are almost 1000 known Commodore user groups nationwide and around the world, this list includes only those that have been officially recognized by Commodore as Approved User Groups. If your group would like to apply for Approved status, contact Pete Baczor, User Group Coordinator, at Commodore Business Machines, 1200 Wilson Drive, West Chester, PA 19380.

Commodore user groups provide invaluable assistance to Commodore computerists. If you are looking for people who share your computing interests, or if you need help getting started with your computer, contact the group near you.

ALABAMA

Birmingham
Birmingham Commodore Club
P O Box 59564
Bob Tatum

Decatur
Valley Commodore User Group
915 Way Thru the Woods SW
David W Nelson

Florence
Shoals Commodore Users Group
114 Van Fleet Dr
Russel C Brockwell

Huntsville
Computeen Computer Club
10118 Shades Road
Bryan Jordan

Montgomery
M A C K S
P O Box 210126
Charles Russell

Scottsboro
Scottsboro C-64 Users Group
Route #5 Box 255
Richard Radon

ALASKA

Anchorage
Anchorage Commodore User Group
P O Box 104615
Troy L Crow, Jr

ALBERTA CANADA

Hinton
Hinton Computer Club
P O Box 2431
K Bartlett

ARIZONA

Chandler
Arizona VIC & 64 Users
904 W Marlboro Cir
Thomas A Monson

Chino Valley
Prescott Area Commodore Club
1631 N Canfield Ave
Richard Pearce

Globe
Gila Hackers
Route #1, Box 34
Paul R Machula

Sierra Vista
Thunder Mountain Commodore User Group
P O Box 1796
Michael Magatagan

Tucson
Catalina Commodore Computer Club
P O Box 32548
George Pope

ARKANSAS

North Little Rock
River City Commodore Computer Club
P O Box 4298
G Gordon Yoder, Jr

Pine Bluff
Commodore Computer Club of Pine Bluff
P O Box 1083t
Bruce Ashcraft

BRITISH COLUMBIA CANADA

Victoria
Juan de Fuca C64 Users' Group
442 Tipton Rd
Bryan Wilkinson

CALIFORNIA

Auburn
Auburn Commodore Computer Club
P O Box 4270
Pat Strub

Concord
Commodore Connection
P O Box 272106
Richard Moxley

Concord
Diablo Valley Commodore User Group
P O Box 27155
Richard Jensen

Fullerton
HFEA Commodore Computer Club
P O Box 3310
Ed Charles

Huntington Beach
West Orange County Commodore UG
20311 Ravenwood Lane
Milton Brown

Los Osos
San Luis Obispo Commodore Club
1766 Ninth Street
Joan Rinehart

Newport Beach
Ford Aerospace Commodore Users Group
Ford Rd, Box A,
Mail Stop #2/208
Joseph R Pasek

Oceanside
Oceana-64
1004 Plover Way
Sam Brooks

Paso Robles
Simply Users of Computers Combinin
301 Veronica Drive
Wayne Weichel

Sacramento
Sacramento Commodore Users Group
5900 Bamford Dr
Lanny Hartzberg

San Diego
San Diego Commodore Users Group
P O Box 86531
Jane Campbell

San Rafael
Marin Commodore Computer Club
665 Las Colindas Rd
Elmer E Johnson

Santa Barbara
Santa Barbara Commodore Users Group
4520 Via Vistosa
Walter Hauz

Stockton
Stockton Commodore User Group
2929 Calariva Dr
Rita McCann

Studio City
Southern CA 64 Users Group
3852 Riverton
Joe Allain

Ventura
64/20 Club
6464 Sheawater St
Greg Burns

COLORADO

Aurora
Colorado PET Users Group
676 S Quentin St
Jon C Almon

Central City
Black-Cat Software
P O Box 144
Jason M Murphy

Grand Junction
Western Slope Commodore User Group
P O Box 4142
Joe Gardner

Lakewood
Commodore Condor Club
1680 Lewis St
Ronald Musich

CONNECTICUT

Danbury
Fairfield County Commodore User Group
P O Box 212
Kenneth H Hottes

East Hartford
Hartford County Commodore Users Group
P O Box 8553
J Russell Curtiss

North Haven
Greater New Haven Commodore User Group
P O Box 796
Ray Goudneau

Stamford
Stamford Area Commodore Society
P O Box 1337
Richard P Mozzer

Vernon
Capitol Region Commodore Club
P O Box 2372
Peter Brochu

DELAWARE

Newark
Newark Commodore Users Group
210 Durso Dr
Robert E Black, Jr

DISTRICT OF COLUMBIA

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1947th HSG-MWR AF Rec Svcs

FLORIDA

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Citrus County Commodore Club
P O Box 503
Walt Rogers

Bradenton
Manasota Commodore User Group
916 E 35th Ave Dr
Robert O Bronson

Englewood
RAM ROM 64
P O Box 1369
Clyde S Davies

Ft Walton Beach
Okaloosa Commodore User's Group
412-A Cobia Avenue
Calvin Jones

Gainesville
Gainesville Commodore Users Group
P O Box 14716
Drew Hurley

Jacksonville
UNF Commodore Computer Club
University of Northern Florida
Jay Huebner

Lakeland
Lakeland Police User Group
2332 Crystal Park North
Joseph M Salvadore

Melbourne
EL-Shift-OH
P O Box 361348
Ted Semanism

Miami
M I C E
11110 Bird Rd
Ben C Demby, Jr

Miami
Miami 2064
12911 SW 49th Street
Jim Juftman

Miami Springs
Miami Springs Hialeah User Group
517 Wren Avenue
Charles P Taffinder

Ocala
Tri-County Commodore Users Group
P O Box 1151
Helen Serine

Orange Park
Commodore Computer Club
3931 Collins Rd
Loring Pitts

Orlando
Central FL Commodore Users Group
P O Box 7326
Thurmon Lawson

Ozona
Suncoast 64's
P O Box 6628
Robert P Deiley

Pensacola
Commodore Users of Pensacola
P O Box 3533
Debbie Johnson

Port Charlotte
Charlotte County Commodore Club
567 N Ellicott Cir
Lee Traux

Ruskin
C U S H
107 N Branch Rd W
David Kinne

Titusville
Titusville Commodore Club, Inc
890 Alford St
Robert B Murray

GEORGIA

Albany
Albany Commodore Amateur Computer
P O Box 5461
Robert B McHugh

Athens
Athens Commodore Enthusiasts [ACE]
130 St James Drive
Darrell Wesley

Decatur
Commodore Users' Group of Atlanta
633 Clairmont Cir
Donald E Schwab

Savannah
SCUG C/O
103 Virginia Ave
Dale Reagon

HAWAII

Honolulu
Hawaiian Electric CUG
820 Ward Ave
Rodney Yim

IDAHO

Blackfoot
Blackfoot Users' Group
760 Janet St
Sam Wilcox

Pingree
The Blackfoot Users' Group
417 South 1200 West
Curtis Smith

ILLINOIS

Alton
East Side Computer Club
3103 Clay St
Dennis McGlasson

Argonne
Argonne Personal Computer Club
P O Box 337
Duane R Bradley

USER GROUPS

Aurora
Fox Valley 64 Users Group
1034 E Benton St
Frank Christensen

Bradley
Kankakee Hackers
200 E Broadway
Bill Brouillet

Canton
Canton Area Commodore Users Group
R R #1
Robert S Smolich

Chicago
Amoco Corp Microcomputer User Group
200 E Randolph—MC 1001
Richard Ryan

Darien
Suburban Commodore Users Group
P O Box 2201
Stan Niemiec

Galesburg
Knox Commodore Club
195 Olive St
Randy L Fox

Joliet
Com Ed Employee Commodore UG
1910 S Briggs
John McDowell

Lacon
Heart of IL Commodore Users Group
904 Fifth St
Robert Saville

Monmouth
Western IL Commodore Users Group
906 West 6th Ave
Robert Cokel

Murrayville
Jacksonville Area Commodore UG
4 Purcell St P O Box 135
Greg Simpson

Springfield
Capitol City Commodore Computer
P O Box 2961
Mike Stout

Springfield
SPUG Computer Club
3166 Concord
Bill Eardley

INDIANA

Bloomington
Bloomington Commodore User's Group
800 E Atwater
Merrill J Allen

Evansville
Commodore Computer Club
P O Box 2332
Bruce Farley

Greenfield
C H U G
1322 Fairview Dr
Gregory A Chaney

Kokomo
Kokomo Commodore Computer Club
6016 Yale Court
Richard N LaMott

Lafayette
Commodore Owners of Lafayette
P O Box 5763
Ross Indelicato

Logansport
Logansport Commodore Club
2329 Myers Lane
Howard C Peoples

Terre Haute
Western Indiana Commodore Users
P O Box 1898

IOWA

Ames
COUGAR Commodore User Group
P O Box 2302
John Smith

Spencer
Syntax Errors Anonymous
1224 14th Avenue West
Russell S Oechsle

Waterloo
P E C C U G
333 Joy Dr
Al Sorensen

KANSAS

Atchison
Atchison Commodore Users Group
P O Box 396
Henry F Dove

Hays
High Plains Commodore User Group
1302 Western Plains Dr
Alan Clingingsmith

Hutchinson
Salt City Commodore Club
P O Box 2644
Wendell D Hinkson

Lawrence
Lawrence Commodore Users Group
P O Box 2204
Joe Hewitt

KENTUCKY

Glasgow
Glasgow Commodore User Group Inc
P O Box 154
Steve England

Lexington
Commodore UG of Central Kentucky
546 Halifax Dr
Virgil M Mills

Louisville
LUCKY
8601 McKenna Way
R D Bishop

Madisonville
Commodore UG of Madisonville
CUGOM
534 Thompson Ave
Richard Byrd

LOUISIANA

Baton Rouge
Baton Rouge C-64 User Group
P O Box 1422
Byron Beverly Jr

Lake Charles
Lake Charles Users' Group
5631 Lakelyn
Nelson Fontenot

Metairie
Sixty-Four Um
4317 Stockton Street
Elizabeth S Hoffmann

Shreveport
Ark-La-Tex Commodore Computer Club
5515 Fairfax Ave
Bill Walker

Swartz
Northeast LA Commodore Users Group
P O Box 175
Beckie Walker

MAINE

Brunswick
Your Commodore User Group
175 Columbia Ave
Darlene English

Houlton
Southern Aroostook Commodore Users
P O Box 451
Robert Blanchette

MARYLAND

Baltimore
Randallstown Commodore Users' Group
3702 Durley Lane
Chris C Schildt

Hagerstown
Hagerstown User Group
23 Coventry Lane
Joseph F Rutkowski

Leonardtown
PAX/COM/64
240 Jefferson St
David J Hamblin

Reisterstown
CUM-BACC
P O Box 479
William J Kolodner

Riva
Annapolis Commodore User Group
P O Box Box 171
Don Chriscoe

Silver Spring
Vic Appreciators (VICAP)
10260 New Hampshire Avenue
Hugh S Pettis

Towson
BAYCUG
12 Wilfred Court
Clewell Howell Jr

MASSACHUSETTS

Fall River
M E M O
P O Box 3336
Kevin Cray

Rockland
Rockland Commodore User Group
98 Myrtle Street
Owen F Mahon

Westfield
Pioneer Valley Commodore Club
6 Laurel Terrace
Marvin S Yale

MICHIGAN

Bay City
Commodore Connection Club
400 18th Street
James Griffin

Clio
Northern Genesee County Commodore
P O Box 250
Garth J Sims

Dearborn
Ford Commodore Computer Club
P O Box 1201
Harry Tucker

Dollar Bay
Copper Country Computer Users Group
P O Box 196
Risto S Vuorinen

Dryden
ACO
4401 Pinegrove Dr
Arthur Nelson

E Lansing
Lansing Area Commodore Club
954 Trafalger
Jae Walker

Hudsonville
West Michigan Commodore User Group
3317 Van Buren
Ross A Ringerwole

Jackson
Jackson Commodore Computer Club
201 West Michigan
Steven M Bohne

Lennon
Commodore User Group of Durand MI
11715 Park Dr
Marla Romine

Richmond
COMP
7514 Puttygut Rd
Brian Pringle

Southgate
Down River Commodore User Group
15331 Cameron
Nancy A Hanna

Ypsilanti
Washtenaw Commodore Users Group
4490 Oakengates Drive
Eugene McMurray

MINNESOTA

Rochester
Rochester Area Commodore User Group
2526 6th Ave NW
David Moertel

MISSISSIPPI

Biloxi
Coastline Commodore Computer Club
102 Monroe Circle
Norman R Cyr

MISSOURI

Ballwin
MDC RCC Commodore Special Interest
566 Golf Wood Drive
Richard M Velten

Joplin
Joplin Commodore Computer User Group
424 S Florida Ave
Dale Connely

Morehouse
Delta Bootheel Users' Group
P O Box 16
Janet H Hinson

Warrensburg
Commodore User Group Warrensburg
P O Box 893
Buck Sommerkamp

MONTANA

Great Falls
Cascade County Commodore Users Group
P O Box 739
Gerald Spurbeck

Red Lodge
Grizzly Hackers
P O Box 1179
Les Dimich

Stevensville
Missoula Commodore Users
310 8th Street
John Verburg

NEBRASKA

Answorth
Sandhill Peeks & Pokes
237 N Park Street
Ray Stenka

Fremont
Pathfinder Commodore Users' Group
P O Box 683
Jack Quigley

Omaha
Greater Omaha Commodore Users Group
2932 Leawood Drive
Bob Quisenberry

NEW JERSEY

Cherry Hill
Amiga Users' Group of South Jersey
P O Box 3761
Jay Forman

Cherry Hill
S Jersey Amiga Users' Group
523 Society Hill
John Scott

Linwood
C-64 Users' Group of South Jersey
312 Beech Ave
Sam Levine

Matawan
Commodore User Group of Central NJ
112 Old Bridge Rd
David Habler

Roosevelt
Commodore Computer Collection Club
72 Pine Dr
Mel Friedman

Sewell
GC64 Commodore Users' Group
PO Box 292
Pete Achenbach

Westwood
Commodore 64 Beginners Club
680 Leigh Terrace
Tom Martin

NEW MEXICO

Las Cruces
Aviation & Computer Enthusiasts
1220 Birch Drive
Carl H Bogardus

Los Alamos
Los Alamos Commodore Users Group
3974-C Alabama St
Jack L Johnson

NEW YORK

Blue Mountain
Adirondack C-64 Users Group
P O Box 99
Jean Kerst

Brooklyn
Brooklyn Commodore User Group
1735 East 13th St Apt 7-N
Malcolm J Gottesman

Glen Cove
Landing Users Group
17 Barlow Avenue
Don Bikoff

Glendale
Queens Commodore Users Group
75-11 64th Street
Bruce Behrend

Greene
NYTEC User Group
29 Juliand Street
Frank T Moorhead

Hammondsport
Finger Lakes Area Komputer Experts
86 W Lake Rd
Terri Lynne Naiby

Holbrook
CLUB-64
1579 Coates Avenue
Michael McGrath

Levittown
Associated Commmodore Enthusiasts
37 Silver Lane
Chris Maselli

New Hampton
Commodore 64 U G of Orange County
P O Box 238
Stephen P Gerstl

New York
PC & Research Users Group
111 8th Ave 11th FL
Lou Kairys

New York
Technology Not Tricks
619 W 114th Street
Tom Trocco

New York
The New York Times Personal Computer
229 West 43rd Street
Daniel Fersht

Oceanside
Commodore Long Island Club
2949 Roxbury Road
Eric P Miller

Oswego
Oswego Commodore User Group
208 Park Hall Dept Technology
John R Boronkay

Tallman
Computer Club of Rockland
P O Box 233
Paul Franzel

Woodhaven
D-BUG
78-23 91st Avenue
Charles C Wagner

NEWFOUNDLAND CANADA

St John's
Pleasantville Commodore User Group
P O Box 2028
Greg Vincent

NORTH CAROLINA

Greensboro
Triad C-64 Users' Group
3302 Forsyth Dr
C W Blake

Hickory
Unifour Commodore Users Group
P O Box 9324
Janet M Morris

OHIO

Cincinnati
UCOM-64
340 Tangeman University Ctr #136
Bari Cruze

Columbus
Central Ohio Commodore User Group
P O Box 28229
Philip Lynch

Dayton
Page Manor Users' Group
P O Box 31744
Dennis R Paquette

Marion
Marion Ohio Commodore Users Group
775 Wolfinger Road
Richard Munro

New Philadelphia
CUG - Commodore 64 Users Group
702 Park Avenue N W
Jeff Eklund

North Canton
Canton/Akron/Massillon Area User Group
334 Fairview S E
Loren S Hines

Springfield
C H U G
P O Box 2238
Russell C Yeley

Toledo
Commodore Computer Club of Toledo
P O Box 8909
Jeff Hineline

OKLAHOMA

Bartlesville
Commodore Users of Bartlesville
1704 S Osage
Fred Mayes

OREGON

Eastside
Coos Computer Club
P O Box 4066
Patty Chard

Eugene
Lane County Commodore User Group
P O Box 11316
Maria Sayer

Oregon City
Northwest Amiga Group
P O Box 1140
Brian M Gagnier

PENNSYLVANIA

Bethlehem
ABC C-64 CHIPS
3159 Middletown Road RD #3
Thomas Duff

Erie
North Coast Commodore User Group
P O Box 6117
Randall R Hodges

Feasterville
Lower Bucks User Group
P O Box 548
Robert G Stasche

New Kensington
AK-64 Users Group
1762 Fairmont Street
Alton E Glubish

Parksburg
Lighthouse Users Group
103 Peacemaker Dr
Matthew Henry

Philadelphia
SUB-64
P O Box 54208
Will Hines

Pittsburgh
Bettis Commodore User Group
592 Arbor Lane
Bill Campbell

Reading
Commodore User Group of Berks
300 Lackawanna St Apt 9-F
Dave Procopio

Salona
Central PA User Group for Commodore
P O Box 1
Joseph W Coffman

West Chester
Main Line Commodore User Group
1046 General Allen Lane
Emil J Volcheck Jr

SOUTH CAROLINA

Columbia
Commodore Computer Club of Columbia
318 Quincannon Drive
Buster White

Rock Hill
Rock Hill Commodore User Group
417 S Spruce St
Tim Johnson

SOUTH DAKOTA

Rapid City
Port-64
1705 Cruz Dr
Thomas S York

TENNESSEE

Estill Springs
Commodore Users' Club
P O Box 96
Marty Garner

Germantown
Memphis Amiga Group
PO Box 381462
Audrey B McCalla

Memphis
Memphis Commodore Users Group
P O Box 34095
Dwight Campbell

Springfield
Springfield Commodore User Group
Route #1 Box 166
Paul M S Bell

TEXAS

Amarillo
Tri State Commodore Users Group
P O Box 8971
Michael H Williamson

Austin
Commodore Computer Users of Texas
4001 N 1H35
Isaac Norris

Bay City
Bay City Commodore Users Group
2211 Gontier Drive
Glenn McCarthy

Bedford
Mid Cities Commodore Club (MCCC)
P O Box 1578
William Raecke

Longview
Longview User Group
P O Box 9284
Joyce Pope

Texarkana
Ark-La-Tex Commodore Users
P O Box 6473
Stan Fierbaugh

Waco
Heart of Texas Home User Group
332-D Richland Drive
James Domengeaux

UTAH

Logan
Cache Valley Computer Club
467 N 200 W
Jody L Reese

VERMONT

S Burlington
Champlain Valley Commodore User Group
6 May Fair Street
Steve Lippert

VIRGINIA

Alexandria
Arlington VICtims
5521 Harvey Lane
Robin Franzel

Charlottesville
Piedmont Commodore Group
P O Box 5412
John A Stoner

Dale City
Dale City Commodore Users Group
P O Box 2265
Jack B Doyle

Hays
Black Diamond Commodore Society
Rt 2 Box 628
Brian Hearl

Martinsville
Henry County Commodore Computer Club
P O Box 67
Ken Coffelt

Richmond
T R A C E The Richmond Area CE
2316 Lafayette Avenue
E M Rexrode

Virginia Beach
Tidewater Commodore Users Group
P O Box 61814
Mike Loding

WASHINGTON

Burley
Commodore Users of Puget Sound
P O Box 86
Kenneth A Blinn

Richland
Tri-City Commodore Computer Club
P O Box 1064
Jack Garvin

Seattle
University of Washington Commodore User Group
P O Box 75009
John Wilcott

Spokane
Spokane Commodore Users Group
P O Box 1753
Steve Pretorius

Yakima
Central Washington Commodore User Group
P O Box 10937
Russell W Miller

WEST VIRGINIA

Bluefield
Bluefield User's Group C-64 & VIC
P O Box 1190
John M Knowles

Wheeling
C H U G Commodore Home Users Group
81 Lynwood Avenue
Alice Shipley

WISCONSIN

Green Bay
Comm Bay 64
Richard F Luxton

Greendale
M A C E
P O Box 183
Tim Polzek

Janesville
Rock County Commodore Users Group
P O Box 1858
John Berg

Milwaukee
A O Smith Computer Club
P O Box 584
Ben Endejan

New Auburn
Chippewa Valley CUG
R 3
Norman C Rone

HOW TO ENTER PROGRAMS

The programs which appear in this magazine have been run, tested and checked for bugs and errors. After a program is tested, it is printed on a letter quality printer with some formatting changes. This listing is then photographed directly and printed in the magazine. Using this method ensures the most error-free program listings possible.

Whenever you see a word inside brackets, such as [DOWN], the word represents a keystroke or series of keystrokes on the keyboard. The word [DOWN] would be entered by pressing the cursor-down key. If multiple keystrokes are required, the number will directly follow the word. For example, [DOWN4] would mean to press the cursor-down key four times. If there are multiple words within one set of brackets, enter the keystrokes directly after one another. For example, [DOWN,RIGHT2] would mean to press the cursor-down key once and then the cursor-right key twice. Note: Do not enter the commas.

In addition to these graphic symbols, the keyboard graphics are all represented by a word and a letter. The word is either SHFT or CMD and represents the SHIFT key or the Commodore key. The letter is one of the letters on the keyboard. The combination [SHIFT E] would be entered by holding down the SHIFT key and pressing the E. A number following the letter tells you how many times to type the letter. For example, [SHFT A4,CMD B3] would mean to hold the SHIFT key and press the A four times, then hold down the Commodore key and press the B three times.

The following chart tells you the keys to press for any word or words inside of brackets. Refer to this chart whenever you aren't sure what keys to press. The little graphic next to the keystrokes shows you what you will see on the screen.

Syntax Error

This is by far the most common error encountered while entering a program. Usually (sorry folks) this means that you have typed something incorrectly on the line the syntax error refers to. If you get the message "?Syntax Error Break In Line 270," type LIST 270 and press RETURN. This will list line 270 to the screen. Look for any non-obvious mistakes like a zero in place of an O or vice-versa. Check for semicolons and colons reversed and extra or missing parentheses. All of these things will cause a syntax error.

There is only one time a syntax error will tell you the wrong line to look at. If the line the syntax error refers to has a function call (e.g., FN A(3)), the syntax error may be in the line that defines the function, rather than the line named in the error message. Look for a line near the beginning of the program (usually) that has DEF FN A(X) in it with an equation following it. Look for a typo in the equation part of this definition.

Illegal Quantity Error

This is another common error message. This can also be caused by a typing error, but it is a little harder to find. Once again, list the line number that the error message refers to. There is probably a poke statement on this line. If there is, then the error is referring to what is trying to be poked. A number must be in the range of zero to 255 to be poke-able. For example, the statement POKE 1024,260 would produce an illegal quantity error because 260 is greater than 255.

Most often, the value being poked is a variable (A,X...). This error is telling you that this variable is out of range. If the variable is being read from data statements, then the problem is somewhere in the data statements. Check the data statements for missing commas or other typos.

If the variable is not coming from data statements, then the problem will be a little harder to find. Check each line that contains the variable for typing mistakes.

Out Of Data Error

This error message is always related to the data statements in a program. If this error occurs, it means that the program has run out of data items before it was supposed to. It is usually caused by a problem or typo in the data statements. Check first to see if you have left out a whole line of data. Next, check for missing commas between numbers. Reading data from a page of a magazine can be a strain on the brain, so use a ruler or a piece of paper or anything else to help you keep track of where you are as you enter the data.

Other Problems

It is important to remember that the 64 and the PET/CBM computers will only accept a line up to 80 characters long. The VIC 20 will accept a line up to 88 characters long and the 128 a line up to 160 characters long. Sometimes you will find a line in a program that runs over this number of characters. This is not a mistake in the listing. Sometimes programmers get so carried away crunching programs that they use abbreviated commands to get more than the standard number of characters on one line.

"[HOME]" = UNSHIFTED CLR/ HOME	"[PURPLE]" = CONTROL 5	"[F1]" = F1
"[CLEAR]" = SHIFTED CLR/HOME	"[GREEN]" = CONTROL 6	"[F2]" = F2
"[DOWN]" = CURSOR DOWN	"[BLUE]" = CONTROL 7	"[F3]" = F3
"[UP]" = CURSOR UP	"[YELLOW]" = CONTROL 8	"[F4]" = F4
"[RIGHT]" = CURSOR RIGHT	"[ORANGE]" = COMMODORE 1	"[F5]" = F5
"[LEFT]" = CURSOR LEFT	"[BROWN]" = COMMODORE 2	"[F6]" = F6
"[RVS]" = CONTROL 9	"[L. RED]" = COMMODORE 3	"[F7]" = F7
"[RVOFF]" = CONTROL 0	"[GRAY1]" = COMMODORE 4	"[F8]" = F8
"[BLACK]" = CONTROL 1	"[GRAY2]" = COMMODORE 5	"[POUND]" = ENGLISH POUND
"[WHITE]" = CONTROL 2	"[L. GREEN]" = COMMODORE 6	"[SHFT ^]" = PI SYMBOL
"[RED]" = CONTROL 3	"[L. BLUE]" = COMMODORE 7	"[^]" = UP ARROW
"[CYAN]" = CONTROL 4	"[GRAY3]" = COMMODORE 8	

GRAPHIC SYMBOLS WILL BE REPRESENTED AS EITHER THE LETTERS SHFT (SHIFT) AND A KEY ("[SHFT Q,SHFT J,SHFT D,SHFT S]") OR THE LETTERS CMDR (COMMODORE) AND A KEY ("[CMDR Q,CMDR G,COMDR Y,CMDR H]"). IF A SYMBOL IS REPEATED, THE NUMBER OF REPITITIONS WILL BE DIRECTLY AFTER THE KEY AND BEFORE THE COMMA ("[SPACE3,SHFT S4,CMDR M2]").

HOW TO ENTER PROGRAMS

You can enter these lines by abbreviating the commands when you enter the line. The abbreviations for BASIC commands are in your user guide.

If you type a line that is longer than the acceptable number of characters, the computer will act as if everything is ok, until you press RETURN. Then, a syntax error will be displayed (without a line number). Many people write that the computer gives them a syntax error when they type the line, or that the computer refuses to accept a line. Both of these problems are results of typing a line that has too many characters.

The Program Won't Run!!

This is the hardest of problems to resolve; no error message is displayed, but the program just doesn't run. This can be caused by many small mistakes typing a program in. First check that the program was written for the computer you are using. Check to see if you have left out any lines of the program. Check each line of the program for typos or missing parts. Finally, press the RUN/STOP key while the program is "running." Write down the line the program broke at and try to follow the program backwards from this point, looking for problems.

If All Else Fails

You've come to the end of your rope. You can't get the program to run and you can't find any errors in your typing. What do you do? As always, we suggest that you try a local user group for help. In a group of even just a dozen members, someone is bound to have typed in the same program. The user group may also have the program on a library disk and be willing to make a copy for you. For $9.95 per issue, you can also get all the BASIC programs in each issue, as well, from Loadstar, P.O. Box 30007, Shreveport, LA 71130-0007.

If you do get a working copy, be sure to compare it to your own version so that you can learn from your errors and increase your understanding of programming.

If you live in the country, don't have a local user group, or you simply can't get any help, write to us. If you do write to us, include the following information about the program you are having problems with:

The name of the program
The issue of the magazine it was in
The computer you are using
Any error messages and the line numbers
Anything displayed on the screen
A printout of your listing (if possible)

All of this information is helpful in answering your questions about why a program doesn't work. A letter that simply states "I get an error in line 250 whenever I run the program" doesn't give us much to go on. Send your questions to:

Commodore Magazines
1200 Wilson Drive
West Chester, PA 19380
ATTN: Program Problem

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

The Magazine Entry Programs on the next pages are two BASIC machine language programs that will assist you in entering the programs in this magazine correctly. There are versions for both the Commodore 64 and the Commodore 128. Once the program is in place, it works its magic without you having to do anything else. The program will not let you enter a line if there is a typing mistake on it, and better yet, it identifies the kind of error for you.

Getting Started

Type in the Magazine Entry Program carefully and save it as you go along (just in case). Once the whole program is typed in, save it again on tape or disk. Now RUN the program. The word POKING will appear on the top of the screen with a number. The number will increment from 49152 up to 49900 (4864-5545 on the 128) and just lets you know that the program is running. If everything is ok, the program will finish running and say DONE. Then type NEW. If there is a problem with the data statements, the program will tell you where to find the problem. Otherwise the program will say "mistake in data statements." Check to see if commas are missing, or if you have used periods instead of commas. Also check the individual data items.

Once the program has run, it is in memory ready to go. To activate the program type SYS49152 (SYS4864 on the 128), and press RETURN. You are now ready to enter the programs from the magazine. To disable the Entry Program, just type KILL (RETURN) on the 64 or SYS4867 on the 128.

The checksums for each line are the same for both the 64 and 128, so you can enter your 64 programs on the 128 if you'd like.

Typing the Programs

All the BASIC program listings in this magazine that are for the 64 or 128 have an apostrophe followed by four letters at the end of the line (e.g., 'ACDF). If you plan to use the Magazine Entry Program to enter your programs, the apostrophe and letters **should** be entered along with the rest of the line. This is a checksum that the Magazine Entry Program uses.

Enter the line and the letters at the end and then press RETURN, just as you normally would.

If the line is entered correctly, a bell is sounded and the line is entered into the computer's memory (without the characters at the end).

If a mistake was made while entering the line, a noise is sounded and an error message is displayed. Read the error message, then press any key to erase the message and correct the line.

IMPORTANT

If the Magazine Entry Program sees a mistake on a line, it **does not** enter that line into memory. This makes it impossible to enter a line incorrectly.

Error Messages and What They Mean

There are five error messages that the Magazine Entry Program uses. Here they are, along with what they mean and how to fix them.

Continued next page

HOW TO USE THE MAGAZINE ENTRY PROGRAMS

NO CHECKSUM: This means that you forgot to enter the apostrophe and the four letters at the end of the line. Move the cursor to the end of the line you just typed and enter the checksum.

QUOTE: This means that you forgot (or added) a quote mark somewhere in the line. Check the line in the magazine and correct the quote.

KEYWORD: This means that you have either forgotten a command or spelled one of the BASIC keywords (GOTO, PRINT. .) incorrectly. Check the line in the magazine again and check your spelling.

OF CHARACTERS: This means that you have either entered extra characters or missed some characters. Check the line in the magazine again. This error message will also occur if you misspell a BASIC command, but create another keyword in doing so. For example, if you misspell PRINT as PRONT, the 64 sees the letter P and R, the BASIC keyword ON and then the letter T. Because it sees the keyword ON, it thinks you've got too many characters, instead of a simple misspelling. Check spelling of BASIC commands if you can't find anything else wrong.

UNIDENTIFIED: This means that you have either made a simple spelling error, you typed the wrong line number, or you typed the checksum incorrectly. Spelling errors could be the wrong number of spaces inside quotes, a variable spelled wrong, or a word misspelled. Check the line in the magazine again and correct the mistake.

MAGAZINE ENTRY PROGRAM—64

The Magazine Entry Programs are available on disk, along with the other programs in this magazine, for $9.95. To order, contact Loadstar at 1-800-831-2694.

```
10 PRINT"[CLEAR]POKING -";
20 P=49152 :REM $C000  (END AT
   49900/$C2EC)
30 READ A$:IF A$="END"THEN 110
40 L=ASC(MID$(A$,2,1))
50 H=ASC(MID$(A$,1,1))
60 L=L-48:IF L>9 THEN L=L-7
70 H=H-48:IF H>9 THEN H=H-7
80 PRINT"[HOME,RIGHT12]"P;
90 IF H>15 OR L>15 THEN PRINT
   :PRINT"DATA ERROR IN LINE";
   1000+INT((P-49152)/8):STOP
100 B=H*16+L:POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>86200 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
1000 DATA 4C,1F,C0,00,00,00,00,00
1001 DATA 00,00,00,00,00,0D,00,21
1002 DATA C1,27,C1,2F,C1,3F,C1,4C
1003 DATA C1,EA,EA,EA,4C,54,C0,A2
1004 DATA 05,BD,19,C0,95,73,CA,10
1005 DATA F8,60,60,A0,03,B9,00,02
1006 DATA D9,04,C1,D0,F5,88,10,F5
1007 DATA A0,05,B9,A2,E3,99,73,00
1008 DATA 88,10,F7,A9,00,8D,18,D4
1009 DATA 4C,EF,C0,E6,7A,D0,02,E6
1010 DATA 7B,4C,79,00,A5,9D,F0,F3
1011 DATA A5,7A,C9,FF,D0,ED,A5,7B
1012 DATA C9,01,D0,E7,20,2B,C0,AD
1013 DATA 00,02,20,74,C0,90,DC,A0
1014 DATA 00,4C,A9,C1,C9,30,30,06
1015 DATA C9,3A,10,02,38,60,18,60
1016 DATA C8,B1,7A,C9,20,D0,03,C8
1017 DATA D0,F7,B1,7A,60,18,C8,B1
1018 DATA 7A,F0,37,C9,22,F0,F5,6D
1019 DATA 03,C0,8D,03,C0,AD,04,C0
1020 DATA 69,00,8D,04,C0,4C,8E,C0
1021 DATA 18,6D,05,C0,8D,05,C0,90
1022 DATA 03,EE,06,C0,EE,09,C0,4C
1023 DATA CE,C1,18,6D,08,C0,8D,08
1024 DATA C0,90,03,EE,07,C0,EE,0A
1025 DATA C0,60,0A,A8,B9,0F,C0,85
1026 DATA FB,B9,10,C0,85,FC,A0,00
1027 DATA A9,12,20,D2,FF,B1,FB,F0
1028 DATA 06,20,D2,FF,C8,D0,F6,20
1029 DATA BC,C2,20,E4,FF,F0,FB,A0
1030 DATA 18,B9,08,C1,20,D2,FF,88
1031 DATA 10,F7,68,68,A9,00,8D,00
1032 DATA 02,4C,74,A4,4B,49,4C,4C
1033 DATA 91,91,0D,20,20,20,20,20
1034 DATA 20,20,20,20,20,20,20,20
1035 DATA 20,20,20,20,20,20,20,91
1036 DATA 0D,51,55,4F,54,45,00,4B
1037 DATA 45,59,57,4F,52,44,00,23
1038 DATA 20,4F,46,20,43,48,41,52
1039 DATA 41,43,54,45,52,53,00,55
1040 DATA 4E,49,44,45,4E,54,49,46
1041 DATA 49,45,44,00,4E,4F,20,43
1042 DATA 48,45,43,4B,53,55,4D,00
1043 DATA C8,B1,7A,D0,FB,84,FD,C0
1044 DATA 09,10,03,4C,84,C1,88,88
1045 DATA 88,88,88,B1,7A,C9,27,D0
1046 DATA 13,A9,00,91,7A,C8,A2,00
1047 DATA B1,7A,9D,3C,03,C8,E8,E0
1048 DATA 04,D0,F5,60,A9,04,4C,CA
1049 DATA C0,A0,00,B9,00,02,99,40
1050 DATA 03,F0,F0,C8,D0,F5,A0,00
1051 DATA B9,40,03,F0,E6,99,00,02
1052 DATA C8,D0,F5,20,96,C1,4C,12
1053 DATA C2,A0,09,A9,00,99,03,C0
1054 DATA 8D,3C,03,88,10,F7,A9,80
1055 DATA 85,02,A0,00,20,58,C1,20
1056 DATA 89,C1,20,ED,C1,E6,7A,E6
1057 DATA 7B,20,7C,A5,A0,00,20,80
1058 DATA C0,F0,D0,24,02,F0,06,4C
1059 DATA A8,C0,4C,CE,C1,C9,22,D0
1060 DATA 06,20,8D,C0,4C,CE,C1,20
1061 DATA BA,C0,4C,CE,C1,A0,00,B9
1062 DATA 00,02,20,74,C0,C8,90,0A
1063 DATA 18,6D,07,C0,8D,07,C0,4C
1064 DATA EF,C1,88,A2,00,B9,00,02
1065 DATA 9D,00,02,F0,04,E8,C8,D0
1066 DATA F4,60,18,AD,09,C0,69,41
1067 DATA 8D,09,C0,38,AD,0A,C0,E9
1068 DATA 19,90,06,8D,0A,C0,4C,1C
1069 DATA C2,AD,0A,C0,69,41,8D,0A
```

```
1070 DATA C0,AD,03,C0,6D,05,C0,48
1071 DATA AD,04,C0,6D,06,C0,8D,0C
1072 DATA C0,68,6D,08,C0,8D,0B,C0
1073 DATA AD,0C,C0,6D,07,C0,8D,0C
1074 DATA C0,38,E9,19,90,06,8D,0C
1075 DATA C0,4C,52,C2,AD,0C,C0,69
1076 DATA 41,8D,0C,C0,AD,0B,C0,E9
1077 DATA 19,90,06,8D,0B,C0,4C,67
1078 DATA C2,AD,0B,C0,69,41,8D,0B
1079 DATA C0,A0,01,AD,09,C0,CD,3C
1080 DATA 03,D0,20,C8,AD,0A,C0,CD
1081 DATA 3D,03,D0,17,C8,AD,0B,C0
1082 DATA CD,3E,03,D0,0E,AD,0C,C0
1083 DATA CD,3F,03,D0,06,20,CC,C2
1084 DATA 4C,4B,C0,98,48,68,4C,CA
1085 DATA C0,A9,20,8D,00,D4,8D,01
1086 DATA D4,A9,09,8D,05,D4,A9,0F
1087 DATA 8D,18,D4,60,20,A9,C2,A9
1088 DATA 81,20,DF,C2,A9,80,20,DF
1089 DATA C2,4C,D9,C2,20,A9,C2,A9
1090 DATA 11,20,DF,C2,A9,10,20,DF
1091 DATA C2,A9,00,8D,04,D4,60,8D
1092 DATA 04,D4,A2,70,A0,00,88,D0
1093 DATA FD,CA,D0,FA,60,END
```

END

MAGAZINE ENTRY PROGRAM—128

```
5 TRAP 200
10 PRINT"[CLEAR]POKING -";
20 P=4864 :REM $1300  (END AT
   5545/$15A9)
30 READ A$:IF A$="END"THEN 110
80 PRINT"[HOME,RIGHT12]"P;
100 B=DEC(A$):POKE P,B:T=T+B:P=P+1
    :GOTO 30
110 IF T<>59311 THEN PRINT
    :PRINT"MISTAKE IN DATA --> CHECK
    DATA STATEMENTS":END
120 PRINT"DONE":END
200 PRINT:PRINT"DATA ERROR IN LINE";
    1000+INT((P-4864)/8):END
1000 DATA 4C,1E,13,4C,3A,13,00,00
1001 DATA 8E,00,F7,00,42,41,51,57
1002 DATA 0D,00,0D,43,08,14,0E,14
1003 DATA 16,14,26,14,33,14,A9,00
1004 DATA 8D,00,FF,AD,04,03,8D,12
1005 DATA 13,AD,05,03,8D,13,13,A2
1006 DATA 4A,A0,13,8E,04,03,8C,05
1007 DATA 03,60,AD,12,13,8D,04,03
1008 DATA AD,13,13,8D,05,03,60,6C
1009 DATA 12,13,A5,7F,D0,F9,AD,00
1010 DATA 02,20,5B,13,90,F1,A0,00
1011 DATA 4C,6F,14,C9,30,30,06,C9
1012 DATA 3A,10,02,38,60,18,60,C8
1013 DATA B1,3D,C9,20,D0,03,C8,D0
1014 DATA F7,B1,3D,60,18,C8,B1,3D
1015 DATA F0,35,C9,22,F0,F5,6D,06
1016 DATA 13,8D,06,13,AD,07,13,69
1017 DATA 00,8D,07,13,4C,75,13,18
1018 DATA 6D,08,13,8D,08,13,90,03
1019 DATA EE,09,13,EE,0C,13,60,18
1020 DATA 6D,0B,13,8D,0B,13,90,03
1021 DATA EE,0A,13,EE,0D,13,60,0A
1022 DATA A8,B9,14,13,85,FB,B9,15
1023 DATA 13,85,FC,A0,00,8C,00,FF
1024 DATA A9,12,20,D2,FF,B1,FB,F0
1025 DATA 06,20,D2,FF,C8,D0,F6,20
1026 DATA 79,15,20,A3,15,20,E4,FF
1027 DATA F0,FB,A0,1B,B9,EF,13,20
1028 DATA D2,FF,88,10,F7,68,68,A9
1029 DATA 00,8D,00,02,4C,B7,4D,91
1030 DATA 91,0D,20,20,20,20,20,20
1031 DATA 20,20,20,20,20,20,20,20
1032 DATA 20,20,20,20,20,20,91,0D
1033 DATA 51,55,4F,54,45,00,4B,45
1034 DATA 59,57,4F,52,44,00,23,20
1035 DATA 4F,46,20,43,48,41,52,41
1036 DATA 43,54,45,52,53,00,55,4E
1037 DATA 49,44,45,4E,54,49,46,49
1038 DATA 45,44,00,4E,4F,20,43,48
1039 DATA 45,43,4B,53,55,4D,00,C8
1040 DATA B1,3D,D0,FB,C0,06,10,03
1041 DATA 4C,69,14,88,88,88,88,88
1042 DATA B1,3D,C9,27,D0,13,A9,00
1043 DATA 91,3D,C8,A2,00,B1,3D,9D
1044 DATA 00,0B,C8,E8,E0,04,D0,F5
1045 DATA 60,4C,5C,15,4C,C5,14,A0
1046 DATA 09,A9,00,99,06,13,8D,00
1047 DATA 0B,88,10,F7,A9,80,85,FD
1048 DATA A0,00,20,3F,14,20,AE,14
1049 DATA 20,0D,43,84,FA,A0,FF,20
1050 DATA 67,13,F0,D8,24,FD,F0,06
1051 DATA 20,8F,13,4C,8F,14,C9,22
1052 DATA D0,06,20,74,13,4C,8F,14
1053 DATA 20,9F,13,4C,8F,14,A0,00
1054 DATA B9,00,02,20,5B,13,C8,90
1055 DATA 0A,18,6D,0A,13,8D,0A,13
1056 DATA 4C,B0,14,88,60,18,AD,0C
1057 DATA 13,69,41,8D,0C,13,38,AD
1058 DATA 0D,13,E9,19,90,06,8D,0D
1059 DATA 13,4C,CF,14,AD,0D,13,69
1060 DATA 41,8D,0D,13,AD,06,13,6D
1061 DATA 08,13,48,AD,07,13,6D,09
1062 DATA 13,8D,0F,13,68,6D,0B,13
1063 DATA 8D,0E,13,AD,0F,13,6D,0A
1064 DATA 13,8D,0F,13,38,E9,19,90
1065 DATA 06,8D,0F,13,4C,05,15,AD
1066 DATA 0F,13,69,41,8D,0F,13,AD
1067 DATA 0E,13,E9,19,90,06,8D,0E
1068 DATA 13,4C,1A,15,AD,0E,13,69
1069 DATA 41,8D,0E,13,A0,01,AD,0C
1070 DATA 13,CD,00,0B,D0,20,C8,AD
1071 DATA 0D,13,CD,01,0B,D0,17,C8
1072 DATA AD,0E,13,CD,02,0B,D0,0E
1073 DATA AD,0F,13,CD,03,0B,D0,06
1074 DATA 20,89,15,A4,FA,60,98,48
1075 DATA 68,4C,AF,13,A9,04,4C,AF
1076 DATA 13,A9,00,8D,00,FF,A9,20
1077 DATA 8D,00,D4,8D,01,D4,A9,09
1078 DATA 8D,05,D4,A9,0F,8D,18,D4
1079 DATA 60,20,61,15,A9,81,20,9C
1080 DATA 15,A9,80,20,9C,15,4C,96
1081 DATA 15,20,61,15,A9,11,20,9C
1082 DATA 15,A9,10,20,9C,15,A9,00
1083 DATA 8D,04,D4,60,8D,04,D4,A2
1084 DATA 70,A0,00,88,D0,FD,CA,D0
1085 DATA FA,60,END
```

END

ADVENTURE ROAD

Continued from pg. 14

To heal the stone you must first split it with a set of magic tools, then place each fragment on one of six altars where the healing is magically performed. The interface and presentation of this animated action adventure are essentially unchanged from the original game.

For those who missed the original game, this means that you have an aerial view of the maze and profiles of your character and the hordes of monsters, demons and ghosts that are constantly on the attack. Below, a line of icons shows your inventory of weapons, magic spells and potions, and treasure. The interface is a combination of joystick and keyboard commands that permit you to shoot fireballs and arrows at approaching monsters or cast spells by clicking on an inventory icon. A raft of new icons have been added: a magic hammer and chisel, a Demonslayer sword, and 25 icons representing the healing tools.

Gemstone Healer plays more like a puzzle-style adventure than its predecessor, for you must unravel the mysteries of how to use the assorted healing tools. Two more new features assist in this project: the manual contains the Scroll of Paradoxus, with clues that may be deciphered from its weird script and graphics, and scrolls that are found in the maze. When you use a scroll, it momentarily replaces the maze with a text-based message that presents an arcanely worded hint. Rapid-fire shoot-em-up action is as important as puzzle-solving: it's like Robotron in a dungeon, with magic spells to back up your bullets. Animation and sound effects are excellent, and disk access is brisk even on the 1541.

Amiga adventurers who are tired of interactive fiction might find a CinemaWare interactive movie more entertaining. Distributed by Mindscape, *The King of Chicago* casts you as a Chicago gangster in the thirties, and is completely mouse-driven so you don't have to type in commands. Your character's possible actions appear in a cartoon-like thought balloon, and you choose one—but think fast or your character will act independently. Superb 3D graphics and animation deliver a film-like feeling as the characters move and make faces, while an original sound track dramatically underscores the action. Some arcade-style sequences are included to keep you on your toes. (You'll need 512K to play a CinemaWare interactive movie.)

Several 64 adventures are now available for the Amiga: *The Bard's Tale, Ultima II, Phantasie* and *Alternate Reality—The City*. The first three, all multi-character role-playing games, are highly recommended, but I have reservations about *Alternate Reality*. It is a one-character quest without a goal, for all you can do is map the town and develop a character for use in *The Dungeon* and other installments in the series, which will have specific goals to accomplish and enable you to create and build up a character.

A Macintosh game called *Arazok's Tomb* is also being converted for the Amiga. It's a graphic adventure whose standard type-in parser is supplemented with mouse commands in many cases. Set in the misty hills of England, the story begins as you, an investigative reporter, check out legends of an ancient Druid priest buried in a tomb reminiscent of Stonehenge. The text and graphics of this horror story contain adult situations and language, and Aegis recommends parental guidance for anyone under 14. ■

Tips of the Month

Leather Goddesses isn't as difficult as it is funny, but here are some useful tips for those who are still stuck on Venus, Mars or somewhere in between. If you're having trouble with the Venus flytrap, remember the lion traps Tarzan used to make? You'll find the necessary items in Cleveland. Does the ion beam keep killing you when you float down the canal? Then get off the barge at My Kinda Dock and let it sail on without you (solve the riddle, then exit via the catacombs).

Trinity is far more difficult, especially the end game which you reach by successfully crossing the river of death. But before you go, be sure you have the following items: the bag, lantern, birdcage, walkie talkie and emerald. If you're still trying to figure out how to open the white doors on the giant mushrooms, concentrate on getting the sundial to function. If the gnomon won't fit, it's time for a visit to the arbor.

These clues originally appeared in QuestBusters, which now publishes a complete walkthrough of at least two adventures in each monthly issue. If you want to subscribe, send $15 for the next 12 issues to QuestBusters, 202 Elgin Court, Wayne, PA 19087. ■

Continued from pg. 71

and assure no cheating (who, me?) is to have the testing observed by an impartial tester called a proctor. Students who plan to transfer the course credits to a school where they are working on a degree can ask that school to provide a proctor, and most will at little or no cost. But if a school is not convenient, many libraries will provide a proctor for a small fee. Personally, I'm only interested in learning more about data processing, so I may not take the final exam at all, eliminating my need for a proctor. I am, in essence, auditing the class, which is just fine with the network.

After a final exam is finished and sent to the professor, the results usually are reported by mail in six weeks—the same agonizing delay it takes any local community college.

MicroNet

The MicroNet system is a similar network but on a smaller scale. This network is based at Western Carolina University, near Asheville, North Carolina. It is serving as a pilot program which other universities may adopt. I have no idea how many similar projects are springing up across the country, but I wouldn't be surprised if by the time you read this you'll be able to find such a network close to you.

Unlike the Electronic University, classes taken through MicroNet are taught entirely on-line. No special software is required by the student other than a terminal program. But unlike the Electronic University, attendance of a few on-campus classes is required. Normally this means that you must attend the first class and testing for mid and final terms.

The class time of the MicroNet course is more rigid than those offered by the Electronic University, too. Students here are required to log on at regular intervals and the class begins and ends according to a class calendar. But the time and day of on-line classes are determined entirely by the student. So if you want to take your biology class at 4 A.M. on Christmas Eve, that's fine with MicroNet.

Local Advantages

To use MicroNet, all you need is an access number, account name and password. You can register for a class simply by phoning the university, but unlike the Electronic University, you must show up on campus for the first class and the final exam. The class itself, chatting with professors, receiving study assignments, and so on, are all done on-line. But because MicroNet functions much like a traditional bulletin board system, students can exchange ideas not only with their teacher, but with other students as well.

Because MicroNet functions much like a traditional bulletin board system, students can exchange ideas not only with their teacher, but with other students as well.

I really like the chance to share information here. This exchange expanded far beyond the topics pertaining to class. The MicroNet network also maintains several forums where students can chat on-line about everything from robotics to earth science. There is also a conference area for discussing computers as well as a bulletin board where messages of general interest are posted.

There are other advantages to taking classes via local network instead of national. First, there is no hassle or charge for transferring credits between schools or need to hire a proctor for exams. Also (at least with MicroNet), classes may be cheaper on-line than on campus. Because MicroNet is a new educational vehicle, Western Carolina University actually charges less for on-line classes than for traditional classes, and even loans computers free of charge for students without systems as an incentive to get students to try the system. Needless to say, these incentives are working.

The real disadvantages of local networks are caused by the infancy of the technology. Presently, MicroNet offers only one class per semester and it has always been biology-related. So at least here, if you are working toward a degree in any field other than biology, you'll have to look elsewhere for classes. Hopefully, that will change with time.

No Big Phone Bills

When I began investigating on-line classes, I was concerned about running up a large telephone bill, but was happily surprised. Both the networks I explored include the cost of long distance calls in the course charges. The Electronic University minimizes the use of long distance lines by storing most of the course work on the four program disks. This means the only time I'm directly connected to the network is while I'm downloading messages from my instructor or uploading course work via electronic mail. The rest of the time, the course is taught directly from the information stored on disk. MicroNet attempts to reduce their long distance charges by maintaining an 800 phone line.

The Human Touch

The key thing to remember when considering this alternative education is that even though you are taking the course via a computer, the course is taught and you are graded by a living, breathing human instructor. On-line teachers will discuss your progress with the course, assign homework, and administer tests just like their traditional counterparts. Each time you send a completed lesson, your professor will respond within 24 hours.

I've attended more than a few overcrowded on-campus classes, taught by overtaxed professors who never even knew my name much less took time to chat with me. That's not the case with on-line professors. Trying to schedule a conference with an on-line teacher is 100 times easier to do than trying the same thing with a campus instructor.

The one thing your on-line professor won't do is mark you absent, since you get to choose the day and time when classes meet. This flexibility of scheduling is the jewel which makes on-line classes so valuable. With the Electronic University, you fit the classes around your lifestyle instead of trying to bend life around the class. This means you can go to class twice a day or twice a week, and at 3 A.M. or 3 P.M., or any time in between. And if something important prevents you from attending class one week, you can make it up the next—no one will complain and your grade won't suffer because you cut a class.

By the same token, on-line classes are not for the lazy. The classes taught on-line are not watered down, spoon-fed everybody-passes joyrides. Anyone approaching a network class with that assumption is flirting with disaster. On-line courses range from Industrial Psychology to Public Relations and American Lit-

erature to Trigonometry, and all are comparable in every facet to those taught in the traditional classroom.

To pass, you must not only be a good student, but be self-motivated. No on-line teacher is going to complain if you don't show up for class. No letter will be sent to your parents if your grades slip. It is assumed that those who apply to these networks are ready to study and learn. If you're not, save your money. Just as is true of any class, no one passes just because they show up.

The flexible class scheduling of these new networks remove most of the stumbling blocks which have kept thousands from beginning or completing their degree work. If you are one of those who haven't been able to attend classes because of scheduling conflicts, location problems or a physical handicap, these educational alternatives will be welcome.

Subscribers to QuantumLink can learn more about the Electronic University on-line. To contact a counselor directly, call 1-800-225-3276. If you'd like to learn more about MicroNet, contact Linda Perry at Western Carolina University, Cullowhee, North Carolina 28723. ■

INSIDE QUANTUMLINK

Continued from pg. 18

for the many original poems posted by Q-Link poets. There's also Cafe Days, an Interactive Novel area where individuals contribute chapters as part of an experimental novel.

The Reading Room is for those who wish to curl up with their monitor for a quiet evening of reading. Here, works are compiled by author or subject matter so you don't have to thread through pages of message boards. Periodically, the Cafe Message boards are cleaned up and items are transferred to the Reading Room.

Within the Reading Room, you'll find corresponding Prose and Poetry areas plus a Literary Classics area. The Cafe Chronicles contain various articles generated from the Cafe conference rooms. The Editorial Section is composed of political and social commentaries, while the Arts Section deals with computer art.

Download Rooms contain text files, graphic and musical arts, archives of Back Room meetings, and the Cafe Disk Magazine. The Gallery supports the visual and musical arts, plus programs that support these endeavors. The Morgue contains the archived text files of meetings, larger works of prose or poetry, plus back issues.

The Cafe Disk Magazine was still in the planning stages at the time this article was being written, but is intended to be a downloadable disk magazine dedicated to the free mind of the individual. It's planned to contain articles on various philosophical, political and social topics, as well as the fine arts, poetry and literature. Also to be included will be computer graphic arts, music and perhaps exceptional computer programs.

Before I wrap things up, don't forget the new Software Library indexes. They went on-line some time ago and provide an extremely quick and easy way to find and download programs or other items of interest. They're downloading indexes of all of the files that have been added to each Public Domain Software Library over a week's time, with new versions added each week. Really handy addition to that area. ■

Bob Baker is in charge of the New Products Information area on the QuantumLink network. He can be reached on Q-Link via E-mail addressed to RBAKER.

500XJ JOYSTICK

Continued from pg. 66

Ervin Bobo:

Performing as advertised, the 500XJ delivers quick and positive response. The audible "click" allows for precise movement without taking your eyes off the screen, and there is no doubt about where the fire button is since the shape of the base allows for only one (natural) grip so the button is precisely under your finger.

While the contoured design is very comfortable, I doubt it would feel so to left-handers since it is designed to be held in the left hand.

I've used the 500XJ extensively with *Gunship* and found that the short throw of the stick allowed no sloppiness or backlash. Maintaining a stable horizon was, therefore, very easy and banking movements very precise and, although our scores have not improved dramatically, it seems to work just as well with arcade games. ■

Tech Ed. Note: I'm a lefty and find the 500XJ joystick very comfortable. Of course, I do hold it in my left hand, but it seems to work just fine.

What Next for Commodore?

Continued from pg. 80

Gutman: Where do you see Commodore in five years?

Rattigan: I would love to meet the guy who could tell me. You're really talking about 50% of the total life span of this industry, when you think about it. I think it's going to be as unpredictable as the last five years. It's going to go through tremendous emotional highs and lows. There's going to be a whole bunch of people who are going to be proven right and wrong.

"I think you can get into a situation where your total being. . . becomes part of the work environment—and that's a mistake."

The important thing is there's an underlying growth in the industry. There is a base of people now who have become computer literate. People are trading up to new systems, expanding, replacing, and going into multiple ownership.

On the other hand, the industry still doesn't have its act together in terms of why people should use these things. You've got 15% household penetration in the U.S. That means in the great unwashed masses out there, 85% have not been convinced of the benefits of owning a computer. So you've got this schizophrenia going on, and that will shake out over time.

Like I said, I never got beyond the slide rule. Calculators were the next generation and computers were the next. So I'm sort of two generations behind. My kids interface with computers the way I did with the slide rule.

What you're going to have in time is one generation graduating into the next. That is going to give the industry a good boot in the 1990's, because kids are comfortable with the darn things. When it comes to teaching a language, teaching a kid to ski, or getting involved with something mechanical, the younger they are the better they are. Because they're more malleable, they're not afraid to make mistakes. As you get older, people want to avoid making mistakes. They don't want to mispronounce a foreign word. They don't want to fall down on the slope.

Gutman: As you look back, how close was Commodore to going out of business last year?

Rattigan: I guess that depends on your perspective. Close is a funny word. If you're running along the edge of a cliff and it's a thousand feet down, I guess you could find that close. I don't consider it close until you start falling off the edge. We didn't fall off the edge. We may have gotten close, but we didn't fall.

You had the industry hitting a stone wall in the latter part of 1984. It was the same scenario with various manufacturers. We all proved we could lose money, whether it was Commodore, Apple or IBM. And then all of a sudden the pundits who two years ago were saying the world was going to turn into a computer were saying, "Is there a computer industry anymore?" People sort of swing from left to right in extremes in terms of their attitudes.

In February of 1986, our stock was at 4⅞. That probably, from an outsider's perspective, is the closest we ever got to going out of business. We're currently [December, 1986] trading at around 9 [11¼ as of January 15, 1987]. People over time will gain confidence that the company has regained its fiscal integrity. We have our act together. If we hadn't made some tough decisions, this company wouldn't have survived.

Gutman: I'd like to throw out a few buzzwords and get your reaction to them. Let's start with desktop publishing.

Rattigan: I think Apple's done a great job at identifying a solution and marketing it. It's reversed the fortunes of the Mac for them. Prior to the Laserwriter, the Mac wasn't doing great things. But they did their homework, identified a niche and did a very good job.

Gutman: Artificial intelligence.

Rattigan: That is probably, like telecommunications, ahead of its time. For a company such as ours, it's something to be aware of and track, but not something we're devoting research dollars to at the present time.

Gutman: Computer-aided design.

Rattigan: As we increasingly bring out higher end machines, I think that's an area we and our products will increasingly get involved in. But obviously, based on what our historical product line has been, that has not been a real factor, and certainly not in the U.S. market.

Gutman: CD-ROM.

Rattigan: This area comes down to a question of consumer acceptance and price and value. I'm not sure it's there yet.

Gutman: Jack Tramiel, founder of Commodore and now head of your biggest competitor?

Rattigan: None. None whatsoever. If he were sitting here, it would be the first time I ever met him. He smokes cigars, so he can't be all bad.

Gutman: Who's your biggest hero in life?

Rattigan: Batman. No, no, I don't think there's any such thing as biggest. I think during your life you meet a whole series of people who at various times you admire and respect for different reasons. A lot of that's associated with your own development and maturity. The answer at 18 is different than the answer is today.

Gutman: So what's the answer today?

Rattigan: Oh, I don't know. I guess my granddaughter.

Gutman: What would you do if your granddaughter brought home an Atari ST one day?

Rattigan: First of all, it would be pretty tough for her to carry, because she's only 14 months old. Second, I think I'd probably send her off to have her IQ tested. Hopefully, we're smart enough so she wouldn't make that mistake in terms of what we have to say about our products.

Gutman: What are some of your outside interests?

Rattigan: I read a lot, ski a lot. It's very, very important that you maintain an equity in relationships with people that are apart from the main core of your business. In other words, I think you can get into a situation where your total being and essence in life becomes part of the work environment—and that's a mistake. Because really it's an office you occupy where you work hard and make a contribution. You're fairly compensated, but the day it's over, it's over. When Reagan leaves in 1988, there's a new President. The office does not go with the man.

I've seen too many people who get to be 60 and don't know what to do for the rest of their lives. You have to maintain equity in relationships with people so there's something they can relate to that's you. A lot of people in business lose sight of that.

COMPUTER TUTOR/VECTORS

Continued from pg. 90

```
   NEXT i
RETURN
InitColors:
    FOR i=0 TO 31:READ red,green,blue
    rgb i,red,green,blue
    NEXT i
RETURN

'                            -----  Subroutines  -----
Quit: zzz=0:RETURN

Draw0:   GOSUB UpdateArray
     a(f)=X:B(f)=Y:c(f)=pen     'save to arrays our x & y
                                'pos, and current color Draw:
LINE (cx,cy)-(X,Y),pen   'Draw line from vertex RETURN
                                '(cx,cy) to mouse pointer

ColorChange:  X=ABS(X)    'X could be -1, which we don't want
    pen=INT(X/10) AND maxcolors    'X pos determines color
                                'selected, with 32 boxes
RETURN                          'each 10 pixels wide.

Move:
    MoveFlag=1:RETURN      'flag needed by our mouser routine
Mover:
    MoveFlag=0          'Mouser sent us here. Turn flag off.
    cx = X:cy = Y       'Our new vertex = current X,Y pos
    GOSUB UpdateArray
    a(f)=900:B(f)=cx:c(f)=cy    'save the move to arrays
    RETURN
ReMem:               'resets array pointer to start from scratch
    f=0
    RETURN

Clean:                          'CLS and remember it in arrays
   GOSUB UpdateArray
   a(f)=0:c(f)=0:B(f)=800       '800 is just arbitrary flag
   GOSUB InitScn

   RETURN

RndC: IF RndFlag THEN RndFlag=0 ELSE RndFlag=-1     'a simple
RETURN                                              'toggle switch

Play: CLS:rgb 1,0,0,0       'Set window frame to black
                                  '(invisible)
     FOR i=0 TO f                 'f points to last cell used in
                                  'our arrays
       IF B(i)=800 THEN CLS: GOTO ExitP    '800 flags CLS IF
       a(i)=900 THEN cx=B(i):cy=c(i): GOTO ExitP
       X=a(i):Y=B(i):pen=c(i)      'if no flags we'll go to
                                   'draw
       GOSUB Draw                  'but skip past Draw0 (which
                                   'would resave to arrays)
ExitP:
     NEXT i
      GOSUB InitScn:rgb 1,5,5,5   'restore our window frame,
RETURN                             'dark grey
UpdateArray:
    f=f+1              ' Increase our pointer to next cell IF
    f=arraysize+1 THEN
     f=arraysize       ' Array dim'd to arraysize
     BEEP              ' Out of space, so warn user
    END IF
    RETURN

999 : '                        ----- Input/Output -----
errHandler:
    IF ERR>50 AND ERL>999 THEN
     RESUME 1000    'give user another chance
    ELSE
     RESUME ErrExit     'clean up and quit
    END IF

Disk:
    WINDOW 3,"Load & Save Vectors",(1,100)-(299,180),0,1
1000 :    ON ERROR GOTO errHandler    'Set error trap for I/O
    IF ERR THEN PRINT  "Error:";ERR  'Files not Found &
                         'other disk errors will resume here.
    PRINT "Load, Save, or Return to canvas?"
    PRINT " (Press L,S, OR R)"
GetKey:
    a$=INKEY$:IF a$ = "" THEN GetKey
'a$=INKEY$ is like GET a$ in other Basics
    a$=UCASE$(a$)      ' force to uppercase so we can accept
                       ' "s" or "S", "l" or "L"
    IF a$ <> "S" AND a$ <> "L" THEN WINDOW CLOSE 3:RETURN IF
    a$ = "S" THEN GOTO SaveRoutine
    GOSUB FileName
    OPEN "i", #5, fame$    'Open "i" means open for input
```

Continued on pg. 128

VECTORS

Continued from pg. 127

```
    PRINT  "Looking for ";fame$:PRINT  "OK"
    rgb 1,0,0,0    '--Turn border black for unframed canvas
    WINDOW CLOSE 3
    CLS
          '--Input file, 3 words at a time
      WHILE NOT EOF(5)
      X=CVI(INPUT$(2,#5)):Y=CVI(INPUT$(2,#5))
      pen=CVI(INPUT$(2,#5) )
      IF Y=800 THEN CLS: GOTO ExitL    '800 flags CLS
      IF X=900 THEN cx=Y:cy=pen: GOTO ExitL
                          '900 means vertex move (flag)
      pen=pen AND maxcolors    'to catch errors
      GOSUB Draw  'Draw, but skip past save-to-array part
ExitL:         'our flagged command items skip to here to
    WEND       'avoid draw
    CLOSE 5:GOSUB InitScn
    rgb 1,5,5,5      '--restore our dark grey border
RETURN

SaveRoutine:
  PRINT "Open new file, or Append to old?"
  PRINT " (Press O OR A)"
GetKey2:
  a$=INKEY$:a$=UCASE$(a$)
  IF a$ <> "O" AND a$ <> "A" THEN GetKey2
  GOSUB FileName
  PRINT "Saving "fame$
  OPEN a$, #5, fame$
   FOR i=0 TO f '--last cell used in our arrays
     PRINT #5, MKI$(a(i));MKI$(B(i));MKI$(c(i));
   NEXT i
  CLOSE 5: WINDOW CLOSE 3: RETURN

FileName:
   INPUT "File Name";fame$
   RETURN

DATA Choices,RandomColors,MoveVertex
DATA PlayBack,ClearScreen,RecordReset,Disk,Quit
DATA 0,0,0,5,5,5,5,0,0,0,0,5,0,5,0,5,5,0,0,5,5,5,0,5
DATA 8,8,8,8,3,3,3,3,8,3,8,3,8,8,3,3,8,8,8,3,8,10,10,10
DATA 10,0,0,0,0,10,0,10,0,10,10,0,0,10,10,10,0,10,12,12,12
DATA 15,0,0,0,0,15,0,15,0,15,15,0,0,15,15,15,0,15,15,15,15
DATA 15,6,3,10,15,5
```

END

SCRAMBLED WORDS

Continued from pg. 92

```
210 IF CT=80 THEN CT=0:GOSUB 20'FKHC
220 IF A=5 THEN 330'DFOA
230 FOR G=1 TO A'DDSB
240 IF(B-G)*(C-G)*(D-G)*(E-G)*(F-G)=0
    THEN 320'MYBM
250 IF A=6 THEN PRINT WD$(B)WD$(C)WD$
    (D)WD$(E)WD$(F)WD$(G),
    :CT=CT+1'GUQP
255 IF CT=80 THEN CT=0:PRINT
    :GOSUB 20'GLMM
260 IF A=6 THEN 320'DFOE
270 FOR H=1 TO A'DDTF
280 IF(B-H)*(C-H)*(D-H)*(E-H)*(F-H)*
    (G-H)=0 THEN 310'ODET
290 PRINT WD$(B);WD$(C);WD$(D);WD$(E);
    WD$(F);WD$(G);WD$(H),:CT=CT+1'DFKT
300 IF CT=80 THEN CT=0:PRINT
    :GOSUB 20'GLMD
310 NEXT H'BBBX
320 NEXT G'BBAY
330 NEXT F'BBYA
340 NEXT E'BBXB
350 NEXT D'BBWC
360 NEXT C'BBVD
370 NEXT B'BBUE
380 GOSUB 20:GOTO 30'CFVH
```

END

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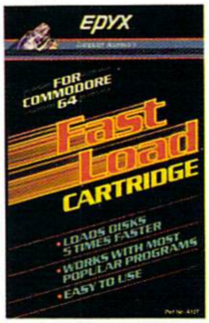
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